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COLORADO RIVER
WATER QUALITY IMPROVEMENT PROGRAM
FINAL ENVIRONMENTAL IMPACT STATEMENT

for

LOWER GUNNISON BASIN UNIT, MONTROSE AND
DELTA COUNTIES, COLORADO

and

UINTAH BASIN UNIT, DUCHESNE, WASATCH
AND UINTAH COUNTIES, UTAH

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SOIL CONSERVATION SERVICE

April 1982

**United States
Department of
Agriculture**



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Colorado River
Water Quality Improvement Program
Final Environmental Impact Statement
for the Lower Gunnison and Uintah Basin Units

Lead Agency

U.S. Department of Agriculture, Soil Conservation Service

Cooperating Agencies

Agricultural Stabilization
and Conservation Service, USDA

Bureau of Reclamation
Service, USDI

Environmental
Protection Agency

States and Counties Directly Affected

Colorado

Delta County

Montrose County

Utah

Duchesne County

Uintah County

Wasatch County

Abstract - Lower Gunnison Basin Unit. The discussion of the Lower Gunnison unit shows that irrigated agriculture on 171,000 acres, contributes about 840,000 tons of salt to the Colorado River annually. Improved management of irrigation water including land leveling, measuring water onto the field and lining onfarm earthen ditches and off-farm laterals can reduce the river's salt load by as much as 500,000 tons, reducing salinity concentrations at Imperial Dam by 52 milligrams per liter. Local benefits resulting from these improvements would be reflected in reduced costs of production, improved irrigation systems and increased crop yields. A worst-case analysis shows improvements to this level could impact up to 13,200 acres of wetland (in one alternative), that have principally developed as a result of irrigation in the valley for about 100 years. These wetlands have a habitat value of 461,200 units. The recommended plan, if implemented, would reduce salt loading by 335,000 tons per year, which could impact 3,800 acres of wetlands (10 percent of the wetlands in the Lower Gunnison Basin Unit).

Abstract - Uintah Basin Unit. Onfarm return flow from 205,000 acres of irrigated land in the Uintah Basin Unit presently contributes 177,200 tons of salt to the Colorado River annually. Onfarm irrigation efficiency improvements through better control and management of irrigation water will reduce the annual salt contribution by 76,600 tons and increase average annual streamflow by 20,200 acre-feet. This reduces the salt concentration by 10.3 milligrams per liter at Imperial Dam or allows the water quality at Imperial Dam to be maintained at the present level while developing an additional 86,000 acre-feet of water. Improvement in average onfarm irrigation efficiency from 34 to 51 percent will be accomplished by 1) installing and using water conveyance and control structures and measuring devices, 2) using the irrigation system best adapted to the soil, crops and level of management desired, 3) utilizing soils information to properly design and layout irrigation systems, and 4) applying the proper amount of water at the proper time to meet crop consumptive use. There are about 49,000 acres of wetland wildlife habitat in the basin. In the recommended plan, about 20,000 acres having an acre value of about 7,600 acres will be converted to upland habitat and about 1,900 acres of upland wildlife habitat having an acre value of 630 acres will be disturbed during construction. Wildlife habitat maintenance and improvement and better farm crops with grain and corn added to the rotation will be implemented through long term agreements with individual farmers to help offset losses. In addition loss of irrigation induced wetland is minimized by the fact that conservation measures for salinity control are limited to those acres which have been irrigated for four of the last five years.

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FORWORD

Public Law 93-320, the Colorado River Basin Salinity Control Act, and a memorandum of agreement between the U.S. Bureau of Reclamation (USBR) and the Soil Conservation Service (SCS) give the SCS responsibility to study the effects of onfarm improvements and the resulting reduction in salinity of the Colorado River.

On May 17, 1977, USBR and the SCS published the Final Environmental Statement for the Colorado River Water Quality Improvement Program. Additional information now available from the SCS environmental evaluation of USDA federally-assisted onfarm improvements (nonproject action) underway, indicates that implementation of various onfarm irrigation water management practices in the Lower Gunnison and Uintah Basin Units, could cause significant adverse local or cumulative impacts on the environment. As a result, the SCS has prepared for the Lower Gunnison Basin and Uintah Basin Units this EIS which supplements the Colorado River Water Quality Improvement Program Final Environmental Statement. Conservation measures to accomplish the onfarm improvements are funded through the Agricultural Conservation Program of the Agricultural Stabilization and Conservation Service (ASCS). USBR, ASCS, and the Environmental Protection Agency (EPA) were cooperating agencies in the development of this document.

Several alternatives of onfarm irrigation water management measures and associated lateral work were considered in order to achieve salt load reduction in the Colorado River while (1) minimizing adverse effects on local fish and wildlife resources, and (2) enhancing the efficiency of irrigated agricultural production. Applicable onfarm practices include adjusting the number and frequency of irrigations; proper time of set and flow rate; ditch lining and pipelines; land leveling; lining tailwater ditches; change in irrigation methods; water measurement devices; automated timing devices; shallow water areas for wildlife; and development and preservation of wildlife habitat.

Specific summaries are presented for each unit, and discussion is presented so that each unit can be independently evaluated. The information in this document, is based on the Colorado River Water Quality Improvement Program Final Environmental Statement, or is based on USDA Salinity Reports for the Lower Gunnison Basin Unit (September 1981) and the Uintah Basin Unit (July 1979 and supplemented November 1980). In accordance with the Council on Environmental Quality Regulation (40 CFR 1502.21), some information in these studies is handled by reference, and is not repeated.

The concept of improving irrigation efficiency to reduce the salt load (improved water quality) carried by the Colorado River, presents a conflict with the environmental values of protecting irrigation induced wetland habitat. Since the Salinity Control Act, P.L. 93-320, established that the purpose of salinity studies is to develop alternative actions to reduce salt load carried by the Colorado River, this document presents the trade-off. Potential implementation effects on wetlands are shown for alternative actions. In addition, alternative levels of mitigation are shown. The exact level and type (avoiding, minimizing, rehabilitating, or replacing) of mitigation will ultimately depend on: (1) the program used for USDA implementation (thus far most of the USDA salinity implementation has been nonproject work on individual or contiguous farms which included voluntary wildlife habitat mitigation); (2) possible congressional consideration and approval of unit wide wildlife habitat mitigation (which is outside the present jurisdiction and authority of USDA); and (3) the off-farm

mitigation plan to protect wildlife habitat associated with improvements to canals and laterals that is yet to be developed by USBR for the Lower Gunnison and Uintah Basin Units. However, there are no present commitments for the off-farm mitigation plan to include mitigation measures for onfarm losses.

At the present time wetland losses resulting from USDA activities in the Salinity Control Program in Grand Valley Unit in Colorado, are being partially offset by including wildlife conservation practices in the individual farm conservation plans for the installation of salinity control measures. The wildlife practices have been available at a 90 percent cost-share rate on annual agreements, but the practices are only included in the conservation plan on a voluntary basis. In the Uintah Basin Unit USDA agencies are working with the state divisions of wildlife and with the U.S. Fish and Wildlife Service in the development of the individual conservation plans. Such a system could be a viable wetland mitigation strategy for implementation of salinity control practices in any of the plan alternatives in the Lower Gunnison Basin Unit.

Full mitigation by replacement of habitat (see Tables A 1-4) at a cost of \$2,000 per acre is outside the authority and jurisdiction of the Soil Conservation Service, if implementation occurs as USDA nonproject work on individual or contiguous farms. However, where sufficient field data were available a worst-case analysis of full mitigation by replacement was shown, in accordance with the guidance provided by the Council on Environmental Quality (Federal Register Volume 46, No. 55, 18016-18038).

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I SUMMARY - LOWER GUNNISON BASIN UNIT

This USDA salinity control study of the Lower Gunnison Basin Unit of the Colorado River Water Quality Improvement Program was carried out under Public Law 93-320, the Colorado River Basin Salinity Control Act, dated June 24, 1974, as a means to implement the salinity control policy adopted for the Colorado River. Irrigated agriculture on 171,000 acres in the Lower Gunnison River Valley contributes about 840,000 tons of salt to the Colorado River annually. Measures for improved management of irrigation water including land leveling, measuring of water onto the fields and lining onfarm and off-farm earthen ditches and laterals could reduce the Colorado River's salt load by as much as 500,000 tons, reducing salinity concentrations of the Colorado River at Imperial Dam by 52 milligrams per liter. However, the practical limit of reduction is about 420,000 tons, or 44 milligrams per liter. Local benefits resulting from these improvements would be reflected in reduced costs of production, improved irrigation systems and increased crop yields. Improvements at this level could, based on a worst-case analysis, adversely impact up to 13,200 acres of the 14,800 acres of irrigation influenced wetlands that have developed as a result of introducing irrigation into the valley about 100 years ago. There are an additional 24,800 acres of riparian wetlands that would not be adversely affected.

Eight alternative plans address four levels of resource development for reducing the river's salt load. These levels are: a continuation of ongoing USDA programs (no accelerated action), onfarm irrigation water management (nonstructural alternative), onfarm ditch lining only, and combining improved onfarm irrigation water management with ditch lining at two options of onfarm improvement (manual or automatic). Lining of off-farm laterals is displayed as a supplemental action to six of these alternatives.

Plan 7 is recommended for implementation and was selected after reviewing the eight candidate plans with farmers and ranchers in the valley; with officials from local, state and federal agencies; with other interested groups; and after considering comments on the draft report received from public review. Major factors influencing the selection include the desires of local landowners and operators, cost effective salinity reduction, overall implementation cost, and program administration.

Plan 7 includes improvement of off-farm laterals in addition to those needed for proper operation of the onfarm improvements. The implementation period should be ten years and program effectiveness should be evaluated at three-year intervals to determine if the program is achieving the expected degree of salinity reduction.

The total installation cost including mitigation of Plan 7 is estimated to be \$169,400,000. It is recommended that the federal government share the construction cost at a rate not greater than 75 percent. At 75 percent cost-share the cost to the federal government is \$137,885,000 over the 10-year implementation period, consisting of \$94,545,000 for construction, \$25,740,000 for administrative and technical assistance, and \$17,600,000 to mitigate the loss of habitat values. The total cost to the local people is estimated to be \$31,515,000 for construction and \$800,000 per year for operation, maintenance and replacement after the program is fully implemented.

When completed, implementation of the recommended plan will result in a 335,000 ton per year reduction in salt loading, about a 52 percent reduction in the annual 640,000 ton salt load delivered to the Colorado River from onfarm sources in the Lower Gunnison Basin. Implementation of the recommended plan will impact on 3,800 acres, or 10 percent, of the wetlands in the Lower Gunnison Basin Unit.

The conservation planning portion of implementation will be done on a wide area basis to minimize adverse environmental effects of onfarm practices for salinity control. Important wildlife and wetland areas will be identified and evaluated within the impact area. Practices for protecting or enhancing important wildlife or wetland areas will be identified and goals established for protecting or enhancing these areas.

Further information concerning implementation authorities; level of funding; staging; and recommendations for implementation are discussed in Section VI of "Potential for On-farm Irrigation Improvements, Lower Gunnison Basin Unit Salinity Control Study, Colorado River Salinity Control Program," September 1981.

II SUMMARY - UINTAH BASIN UNIT

Irrigated agriculture on 205,000 acres in the Uintah Basin contributes 240,000 tons of salt to the Colorado River annually. About three-fourths of this amount (177,200 tons) is from onfarm return flow and one-fourth is from canal and lateral seepage losses. Other sources contribute another 270,000 tons for a total of 510,000 tons of salt annually from the Uintah Basin. Improved management of irrigation water, water measuring devices, improved onfarm conveyance systems, improvements or changes in method of application, land leveling, water control structures, and pumping plants reduce the salt load to the Green River by 76,600 tons annually in the recommended alternative. Water management and land treatment measures will also improve crop yields and make better use of irrigation water supplies. The net increase in river flow will be 20,200 acre-feet annually. Implementation of these measures will reduce salinity concentrations at Imperial Dam by 10.3 milligrams per liter.

There are no expected changes in the amount of private irrigated cropland and pastureland which are the principle land uses in the area. However, there will be changes in the wildlife uses of these areas. Changes in air quality will be minor and temporary. There will be 1,870 acres (1 percent) of upland wildlife habitat with an acre value of 630 acres disturbed during installation; 6,635 acres of riparian habitat with an acre value of 3,850 acres converted to upland habitat; 905 acres of wetland habitat with an acre value of 550 acres converted to upland habitat; 6,855 acres of greasewood and salt cedar with an acre value of 1,510 acres converted to upland habitat; and 5,465 acres of grass-sedge habitat with an acre value of 1,750 acres converted to upland habitat. Historical and archeological resources will be assessed on a measure by measure basis so that none will be disturbed. Sprinkler irrigation systems on 79,400 acres will be highly visible during operation. Irrigation pipelines will replace 1,540 miles of onfarm earthen ditches. There is an ongoing water quality monitoring program in progress and wildlife mitigation features are being incorporated into long term agreements with individual farmers and ranchers.

The viable alternatives considered are: (a) future conditions without accelerated action; (b) farmer identified irrigation improvements; (c) maximum potential irrigation improvements; (d) land retirement from irrigation; and (e) a level of irrigation improvements that is a combination of portions of a, b, and c.

The onfarm conservation measures to be installed are compatible with and complementary to the irrigation system improvements being installed in the Public Law 566, Martin Lateral Watershed. They are also compatible to other land treatment watersheds being planned under P.L. 566.

III PURPOSE AND NEED FOR THIS ACTION

The Colorado River system naturally carries a large load of salts (dissolved solids) and suspended sediment. Streamflow depletions resulting from trans-basin diversions, and for irrigation, municipal and industrial uses significantly reduce the supply of water available for dilution of salt loads in the lower river system. In recent years salinity concentrations in the Colorado River have adversely affected downstream irrigated crop production and other uses of the water. The problem is especially severe for water delivered to California, Arizona and Mexico.

Recognition of the water quality problem in the region has caused a number of studies to be made since about 1960. The Colorado River Basin Water Quality Control Project was established in 1960 by the Division of Water Supply and Pollution Control, U.S. Public Health Service. Studies by the Environmental Protection Agency (1971) produced a series of reports on "The Mineral Quality Problem in the Colorado River Basin." Salinity in the river also is documented by the Bureau of Reclamation (1971 and 1974) Status Reports; Colorado River Water Quality Improvement Program Biannual Progress Reports "Quality of Water, Colorado River Basin;" and U.S. Geological Survey Professional Paper 441, "Water Resources of the Upper Colorado River Basin - Technical Report" by Irons and others (1965). Section 201(c) of the Colorado Basin Salinity Control Act (Public Law 93-320) directs the Secretary of the Interior, the Administrator of the Environmental Protection Agency, and the Secretary of Agriculture to cooperate and coordinate their activities effectively to carry out objectives of Title II of P.L. 93-320 as the basin states continue developing their compact apportioned water. In addition, the Lower Gunnison Basin Unit in Colorado and the Uintah Basin Unit in Utah are two of twelve irrigation source control units listed in Section 203 of P.L. 93-320 for the expeditious completion of a planning report as a means to implement the salinity control policy adopted for the Colorado River.

The USDA studies carried out under Public Law 93-320 were done using funds available under Section 6 of Public Law 83-566, the Watershed Protection and Flood Prevention Act. In the course of these studies the SCS cooperated with the USBR in the development of the Final Environmental Statement for the Colorado River Water Quality Improvement Program (May 19, 1977). The Program EIS covers alternative methods for salinity control as well as the overall impacts of structural measures and onfarm management measures. These discussions will not be repeated in this supplement. Additional information is now available from SCS environmental evaluations of USDA federally assisted nonproject actions already underway. This information indicates that implementation of various onfarm irrigation water management measures in the Lower Gunnison and Uintah Basin Units could cause significant adverse local or cumulative impacts on the environment. Therefore, the Soil Conservation Service has prepared this supplement to the Colorado River Water Quality Improvement Program Final Environmental Statement to more specifically reflect these local and cumulative impacts, and to display alternative solutions.

Section 303 of the Clean Water Act requires adoption of water quality standards applicable to interstate waters. The Act's objective is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Section 101), and the Administrator of EPA is required, in cooperation with other Federal, State and local agencies, "to develop comprehensive programs for preventing,

reducing, or eliminating the pollution of navigable waters and ground waters (Section 102a)."

The seven states of the Colorado River Basin acting through the Colorado River Basin Salinity Control Forum developed and agreed upon basinwide water quality standards for salinity, including numeric criteria and a plan of implementation for salinity control in 1975 (1975 Forum report). Each of the Basin-adopted water quality standards were subsequently approved by EPA. The 1975 report described the rationale for the selection of the criteria stations.

In response to Section 303(c) of the Clean Water Act, the Forum in 1978 reviewed the standards. The Forum determined that these 1975 criteria were appropriate. The Forum also reviewed and modified the plan of implementation in 1978. Appropriate documents were adopted by the states.

Again, in 1981, the Forum in response to Section 303(c) reviewed the criteria and determined that the 1975 criteria are still appropriate. The numeric criteria are:

Below Hoover Dam	723 mg/L
Below Parker Dam	747 mg/L
Imperial Dam	879 mg/L

As in 1978, the plan of implementation was reviewed and modified to reflect changes that have occurred since 1978. The principal components of the plan are:

1. Prompt construction by the Department of the Interior of two salinity control units authorized by Section 202, Title II of Public Law 93-320, namely the Paradox Valley and Grand Valley Units.
2. Expeditious authorization and construction by the Department of the Interior of the Meeker Dome Unit and 10 of the units listed in Section 203(a)(1), Title II of P.L. 93-320, or their equivalents after receipt of favorable planning reports.
3. Expeditious implementation by the Department of Agriculture of onfarm and related improvement measures for salinity control.
4. Implementation of salinity control measures by the Bureau of Land Management to reduce salt contribution from public domain lands.
5. The placing of effluent limitations, principally under the National Pollutant Discharge Elimination System (NPDES) permit program, provided for in Section 402 of the Clean Water Act of 1977 on industrial and municipal discharges based on the Forum's 1977 policy on salinity control through the NPDES permits.
6. Implementation of the 1980 Forum policy for the use of brackish and/or saline waters for industrial purposes.
7. Inclusion of the 208 Water Quality Management Plans. Individually, the Basin states have developed water quality management plans to conform to the requirements of Section 208 of the Clean Water Act. The water quality management planning process is continuing. As the plans are refined or new elements added and after such changes have been adopted by the states and approved by EPA, those portions of the plans dealing with salinity control will become part of the implementation plan.

IV LOWER GUNNISON SECTION

A. Introduction

This portion of the supplement to the Colorado River Water Quality Improvement Program EIS covers the cumulative effects of implementing the onfarm irrigation water management and land treatment measures for the Lower Gunnison Basin Unit in Colorado. Environmental impacts of individual conservation practice will be evaluated for each specific practice as it is planned and implemented.

B. Alternative Plans Evaluated

Introduction

This section discusses eight alternative plans that address four levels of resource development for reducing the river's salt load. These levels are: continuation of the ongoing USDA program (the no accelerated action), improved onfarm irrigation water management (the nonstructural alternative), improved onfarm ditch lining, and combining onfarm irrigation water management with onfarm ditch lining with two options of onfarm system improvements. One option requires manual labor, while the second option is adapted to semiautomated time controls for operation. Lining portions of the off-farm delivery systems is displayed as a supplemental action for six of the alternatives. The eight alternative plans are summarized in Table IV-1.

Plan Formulation

The three basic solution alternatives were scoped in plan formulation. Under the first solution the effect of onfarm management of irrigation water was examined. Effective and efficient irrigation requires uniform distribution of water across the field while applying the needed amount of water. Land leveling enhances opportunity for uniform distribution of water. Measuring devices are needed to measure the rate at which water is delivered to the field. The duration of flow must be carefully timed to assure application of the proper amount of water. Thus, the management only solution requires controlling the time of each irrigation set supplemented by land leveling and installing water measuring devices. This solution assumes that, using manual labor, irrigators will irrigate to the recommended time of set thus reducing the volume of deep percolation and volume of runoff from each field. The recommended time of set, calculated for each field and crop, will be a part of the landowner's conservation plan.

The second solution considers onfarm ditch lining where existing earth ditches would be placed in pipelines, or replaced by gated pipe or impervious lining to reduce seepage. A significant share of the salt load pickup is attributed to seepage from earth ditches. Reorganization of onfarm systems will require that water be delivered to the farm at the proper location, elevation, quantity, and pressure suited to onfarm improvements. Therefore, the onfarm ditch lining concept examined the cost and the effect of implementing a program for lining existing onfarm ditches or installing pipelines. Ditch lining under the maximum level of implementation includes improving a sufficient reach of the off-farm water delivery system to assure proper operation of the onfarm improvements.

TABLE IV-1 SUMMARY OF ALTERNATIVE PLANS 6/
LOWER GUNNISON SALINITY CONTROL STUDY, COLORADO

Plan Description	Action	Total Cost (-----\$1,000,000-----)	Net 5/ Benefit (1000 tons/mg/l)	Area Treated (acres)	Salt Reduction (1000 tons)	Average 5/ Cost (\$1000/mg/l)	Wetland Mitigation	
							Area Disturbed (acres)	Area Avoided (acres)
1. Continuation of Ongoing Programs	Onfarm	2.5	0.41	3,400	10	213		
	Mitigation	1.7	-0.21	840	-	-	370	37,030
	Total	4.2	0.20	4,240	10	358	370	37,030
2. Irrigation Water Mgmt. Minimum Level - Selected Areas	Onfarm	7.1	2.08	55,900	35	173		
	Off-farm 1/ Mitigation	0	0	0	0	0		
	Total	3.4	-0.43	1,700	-	-	750	36,650
3. Onfarm Ditch Lining Minimum Level - Selected Areas	Onfarm	10.5	1.65	57,600	35	256		
	Off-farm 2/ Mitigation	30.0	3.25	35,800	95	269		
	Total	16.6	1.20	-	45	314		
4. Irrigation Water Mgmt. & Onfarm Ditch Lining Minimum Level - Selected Areas	Onfarm	6.1	-0.76	3,000	-	-	1,300	36,100
	Mitigation	52.7	3.69	38,800	140	321	1,300	36,100
	Total	51.8	4.22	43,800	150	294		
5. Irrigation Water Mgmt. 7/ & Onfarm Ditch Lining Maximum Level - Selected Areas	Onfarm	26.4	0.64	-	55	409		
	Off-farm 2/ Mitigation	1.8	-0.23	900	-	-	400	37,000
	Total	80.0	4.63	44,700	205	332	400	37,000
6. Irrigation Water Mgmt. & Onfarm Ditch Lining Mixed Levels - Selected Areas	Onfarm	68.6	5.70	41,400	190	308		
	Off-farm 3/ Mitigation	20.9	0.61	-	45	396		
	Total	14.6	-1.82	7,300	-	-	3,100	34,300
7. Irrigation Water Mgmt. & Onfarm Ditch Lining Mixed Levels-Valleywide	Onfarm 3/ Off-farm	104.1	4.49	48,700	235	377	3,100	34,300
	Mitigation	124.0	12.43	117,100	295	358		
	Total	21.5	0.53	-	45	407		
8. Irrigation Water Mgmt. & Onfarm Ditch Lining Maximum Level-Valleywide	Onfarm 3/ Off-farm	27.4	-3.42	13,700	-	-	5,900	31,500
	Mitigation	172.9	9.54	130,800	340	433	5,900	31,500
	Total	139.7	10.23	169,000	300	397		
9. Irrigation Water Mgmt. & Onfarm Ditch Lining Maximum Level-Valleywide	Onfarm 3/ Off-farm	12.1	1.00	-	35	392		
	Mitigation	17.6	-2.20	8,900	-	-	3,800	33,600
	Total	169.4	9.03	177,900	335	431	3,800	33,600
10. Irrigation Water Mgmt. & Onfarm Ditch Lining Maximum Level-Valleywide	Onfarm 3/ Off-farm	291.2	2.81	169,000	370	670		
	Mitigation	23.4	0.66	-	50	399		
	Total	44.1	-5.50	22,000 4/	-	-	13,200	24,200
11. Off-farm ditch lining is not included with this program emphasizing onfarm irrigation water management only. These off-farm actions include lining small and medium laterals included in maximum salt reduction analyses. A limited amount of off-farm ditch lining is included with maximum level onfarm improvements to assure proper operation of onfarm system improvements. Includes 18,300 acres of avoided habitat and 3,700 acres of new habitat development. Costs based on July 1980 price base, amortized at 7 3/8 percent interest over 25 years. Benefits and costs were computed in present value terms using 10-year installation period. Onfarm benefits not included.	Onfarm 3/ Off-farm	358.7	-2.03	191,000	420	727	13,200	24,200
	Mitigation							
	Total							

- 1/ Off-farm ditch lining is not included with this program emphasizing onfarm irrigation water management only.
- 2/ These off-farm actions include lining small and medium laterals included in maximum salt reduction analyses.
- 3/ A limited amount of off-farm ditch lining is included with maximum level onfarm improvements to assure proper operation of onfarm system improvements.
- 4/ Includes 18,300 acres of avoided habitat and 3,700 acres of new habitat development.
- 5/ Costs based on July 1980 price base, amortized at 7 3/8 percent interest over 25 years.
- 6/ Benefits and costs were computed in present value terms using 10-year installation period.
- 7/ Onfarm benefits not included.

Additionally, onfarm improvements will include concrete ditches with headgates and ports or notches, or pipelines and gated pipes with control valves that accommodate semiautomatic timing devices to shut off the flow of water at the prescribed time.

Installation of semiautomatic timing devices for salinity control, although encouraged by SCS, is optional, available to those who may want them, but not required for all who choose to participate in the program.

The third solution considered the effect of combining onfarm water management with lining of the onfarm ditches. Under this third solution two levels of implementation were examined. The minimum level assumes implementing basic improvements in existing irrigation systems and practices suited to manual labor. The maximum level assumes reorganization of existing systems, including making needed improvements in a sufficient reach of the off-farm water delivery system to assure proper operation of the onfarm system. The maximum level also includes the option for designing the onfarm improvements to accommodate the use of semiautomated timing devices to achieve a higher degree of precision in controlling the time of each irrigation set and to reduce the manual labor needed for irrigation. Cost estimates for concrete ditch lining shown for each alternative plan include design and construction features needed to withstand freezing action resulting from carrying winter water for livestock.

Plan formulation included evaluation of the 26 watersheds for levels of improvement and types of benefits to be derived. Alternative plans were formulated under each level of improvement by grouping watersheds to emphasize two planning objectives:

1. Maximize net benefits - onfarm and downstream.
2. Maximize salt load reduction.

Alternatives were formulated by adding treatment until net benefits approached zero for each level of treatment. Results of formulating these alternative plans are shown in Table IV-1.

The next step was to rank the alternative plans by increasing order of total cost and to compare total cost with salt load reduction.

Off-Farm Lateral Improvements.

This USDA study extended the concept of onfarm ditch lining to include improving the off-farm laterals that are outside of the Uncompahgre Project Area under study by the Bureau of Reclamation. Improvement of these off-farm laterals was considered in two parts. It is necessary that onfarm improvements include improving a sufficient length of the distribution laterals to assure proper operation of the onfarm system improvements. It was estimated that 80 percent of the small laterals should be included as an integral part of the onfarm system improvements at the maximum level. The remaining 20 percent of the small laterals and all of the medium sized laterals are included in this discussion of off-farm laterals. Improvement of large canals in Delta County was not cost effective based on preliminary analysis of salt reduction benefits, but is scheduled for further study by the Bureau of Reclamation under their planning for additional development of water resources in the area.

The small and medium sized laterals were analyzed separately so that the cost and the effect of these improvements may be added as a unit to any of the candidate plans as each receives consideration for implementation.

Improvement assumes the use of pipelines to preserve gravity pressure for sprinkler irrigation although impervious ditch lining also may be used.

The construction costs and the effect of implementing cost effective improvements in the off-farm laterals are:

Lateral	Length mi.	Costs			Salt Loading	
		Const.	Admin.	Total	Present	Reduction
		-----\$1,000-----			-----tons/year-----	
ONFARM:						
Small 1/	55	6,340	1,270	7,610	15,000	12,000
OFF-FARM						
Small 2/	13	1,585	320	1,905	4,000	3,000
Large	82	24,795	4,960	29,755	55,000	45,000
Subtotal	95	26,380	5,280	31,660	60,000 3/	50,000 3/
Total	150	32,720	6,560	39,270	75,000 3/	60,000 3/

1/ 80 percent to be included with onfarm program. July 1980 Price Base.

2/ 20 percent remaining for the off-farm program.

3/ Rounded to closest 5,000 tons.

Eight plans showing the greatest salt load reduction for the least total cost are displayed in Table IV-1, and become the candidate plans presented for further consideration.

Plan One - Continuation of Ongoing Programs

This alternative plan assumes continuation of ongoing conservation programs. Landowners in the valley are presently applying conservation land treatment. Some treatment is applied by individuals on land under their control while other practices are implemented by groups of landowners for mutual benefit. Rates of implementation are influenced by the amount of funds available through government cost share and technical assistance programs, the practices eligible for government assistance, and the financial resources of landowners to install irrigation improvements. Application of soil and water conservation measures is expected to continue whether or not an accelerated program for salinity control is forthcoming.

Annual funding of the Agricultural Conservation Program practices through the Agricultural Stabilization and Conservation Service, for federal cost share assistance in the valley during the past few years, has averaged about \$125,000. The most common conservation practices installed under that level of funding are ditch lining or pipelines, land leveling, and some closed drains. The quantities and cost of conservation practices expected to be installed during the next 10 years, assuming continuation of present levels of funding and cost share rates, are tabulated below:

<u>Practice</u>	<u>Unit</u>	<u>Quantity</u>	<u>Estimated Cost</u>
Ditch Lining	Mi	58.0	\$ 1,824,000
Pipeline	Mi	4.5	136,000
Land Leveling	Ac	600.0	212,000
Closed Drains	Mi	2.5	128,000
Total Cost			\$ 2,300,000

Presently, the salt loading from about 18 percent of the irrigated area is not significant. Continuation of the ongoing program is expected to bring another 2 percent of the area within acceptable limits during the next ten years.

Under Alternative Plan One a maximum salt load reduction of 10,000 tons per year, a reduction of less than 3 percent, can be attained. Implementation under the ongoing program could impact on 370 acres of wetland, or 1 percent of wetlands in Lower Gunnison Unit.

Plan Two - Improved Irrigation Water Management - Minimum Level - on
55,900 Acres of Selected Area

This nonstructural plan assumes improved irrigation water management at the minimum level for those watersheds having economic feasibility based on downstream salinity and onfarm benefits. The irrigated area targeted for improvement is 55,900 acres in Watersheds 1, 7, 9, 10, 14, 16, 22 and 23. Off-farm lateral lining is not included.

This plan can be implemented at a one-time construction cost of \$5,947,000. Technical assistance and administrative costs, estimated to be \$1,923,000, make a total installation cost of \$7,140,000. The 35,000 ton reduction in salt load represents an 8 percent reduction in the total salt load being delivered to the Colorado River from onfarm irrigation sources in the Lower Gunnison Basin Unit. Deep percolation would be reduced by 3000 acre-feet, crop consumptive use would be increased 10,000 acre-feet, and consumptive use by hydrophytes and phreatophytes would be reduced 2,000 acre-feet.

Implementation of this plan could impact on an estimated 750 acres of wetlands within the area targeted for improvement, which is about 2.5 percent of the total wetlands in the Lower Gunnison Basin Unit. Full mitigation for the impacted habitat, estimated to cost \$3,400,000, would require upgrading 1/ (at a cost of \$2,000/acre) the habitat value on 1,700 acres of wetlands elsewhere in the valley otherwise undisturbed by implementing this plan.

1/ Upgrading wildlife habitat values could consist of acquisition and application of various management practices to raise habitat values above the present level. Such practices may include fencing, livestock grazing control, tree/shrub planting, creation of open water, revegetation by direct seeding or natural regrowth, and possibly others as dictated by site and management needs.

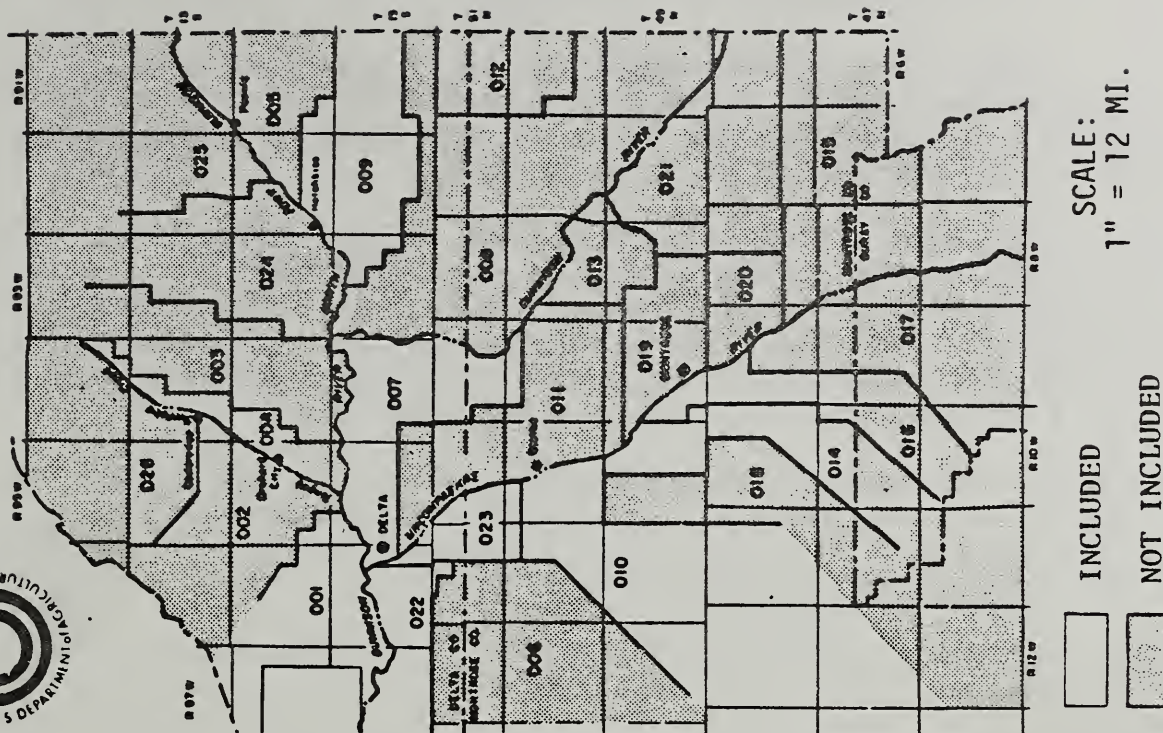


WATERSHED AREAS INCLUDED IN PLAN 2

Plan No. 2
Estimated Quantity and Costs

Items of Work	Units	Quantity	Cost 1/
Measuring Devices	ea.	3,050	\$1,154,000
Ditch Lining	ft.	0	0
Tailwater Ditch Earth	ft.	0	0
Tailwater Ditch Lined	ft.	0	0
Ditch Structures	ea.	0	0
Pipeline	ft.	0	0
Pipe Structures	ea.	0	0
Gated Pipe	ft.	0	0
Land Leveling	ac.	11,740	4,793,000
Closed Drain	ft.	0	0
Automation	ac.	0	0
Subtotal Onfarm Costs			5,947,000
Off-Farm Laterals 2/	mi.	0	0
Subtotal			5,947,000
Off-Farm Laterals 3/	mi.	0	0
Total Cost			5,947,000

- 1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.
- 2/ Lateral improvements needed for proper operation of onfarm system improvements.
- 3/ Remainder of laterals to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.



Plan Three - Onfarm Ditch Lining - Minimum Level - on 35,800 Acres
of Selected Area

This plan assumes implementation of onfarm ditch lining or pipeline at the minimum level for those watersheds having individual economic feasibility based on total benefits. The irrigated area targeted for improvement is 35,800 acres in Watersheds 1, 3, 8, 9, 16 and 20.

The onfarm portion of this plan can be implemented at a one-time construction cost of \$25,006,000. Technical assistance and administrative costs, estimated to be \$4,994,000, make a total installation cost of \$30,000,000. Including the 103 miles of off-farm lateral improvements adds \$13,800,000 to the construction cost and \$2,800,000 to the cost of technical assistance and administration, making a total installation cost of \$46,600,000.

The 95,000 ton reduction in salt loading represents a 22 percent reduction in the total salt load being delivered to the Colorado River. Adding the off-farm laterals with this plan will increase the potential salt load reduction by 45,000 tons, making a total of 140,000 tons.

Implementation of this plan will impact on an estimated 1,300 acres of wetlands within the area targeted for improvement, or about 4.1 percent of the total wetlands in the Lower Gunnison Unit. Full mitigation for the impacted habitat, estimated to cost \$6,100,000, would require upgrading the habitat value on 3,000 acres of wetlands elsewhere in the valley undisturbed by implementing this plan.

WATERSHED AREAS INCLUDED IN PLAN 3



Plan No. 3
Estimated Quantities and Costs

Items of Work	Units	Quantity	Cost 1/
Measuring Devices	ea.	0	0
Ditch Lining	mi.	407	14,825,000
Tailwater Ditch Earth	mi.	0	0
Tailwater Ditch Lined	mi.	0	0
Ditch Structures	ea.	2,700	1,850,000
Pipeline	mi.	155	5,645,000
Pipe Structures	ea.	1,900	1,311,000
Gated Pipe	mi.	73	1,375,000
Land Leveling	ac.	0	0
Closed Drain	mi.	0	0
Automation	ac.	0	0
Subtotal Onfarm Costs			25,006,000
Off-Farm Laterals 2/	mi.	0	0
Subtotal Cost			25,006,000
Off-Farm Laterals 3/	mi.	103	13,300,000
Total Cost			38,806,000

Subtotal Onfarm Costs

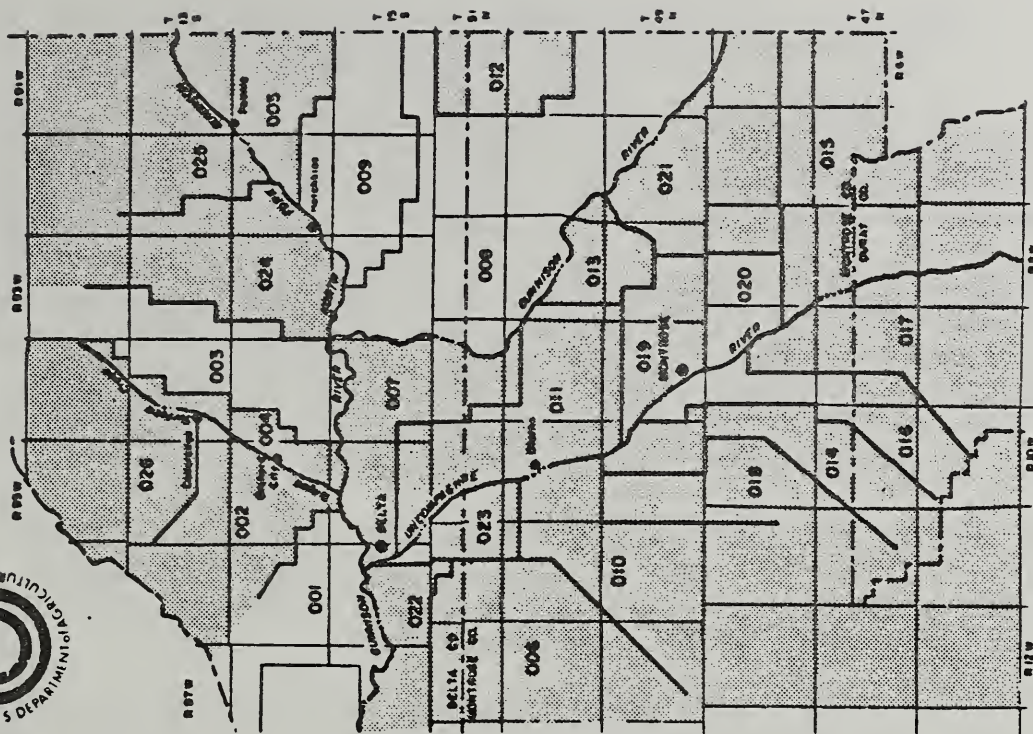
Off-Farm Laterals 2/

Subtotal Cost

Off-Farm Laterals 3/

Total Cost

- 1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.
- 2/ Lateral improvements needed for proper operation of onfarm system improvements.
- 3/ Remainder of laterals to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.



SCALE:
1" = 12 MI.

INCLUDED
NOT INCLUDED

Plan Four - Improved Irrigation Water Management and Onfarm Ditch Lining -
Minimum Level - on 43,800 Acres of Selected Area

This plan assumes implementing irrigation water management and onfarm ditch lining or pipeline at the minimum level only for those watersheds having economic feasibility based on total benefits. The irrigated area targeted for improvement is 43,800 acres in Watersheds 1, 3, 4, 7, 8, 9, 20 and 21.

The onfarm portion of this plan can be implemented at a one-time construction cost of \$43,199,000. Technical assistance and administrative costs, estimated to be \$8,600,000, make a total installation cost of \$51,799,000. Including the 136 miles of off-farm lateral improvements adds \$22,001,000 to the construction cost and \$4,400,000 to the cost of technical assistance and administration, making a total installation cost of \$78,200,000.

The 150,000 ton reduction in salt loading due to onfarm improvements represents a 34 percent reduction in the total salt load being delivered to the Colorado River due to irrigation. Treating off-farm laterals will reduce salt loading by 55,000 tons, making a total of 205,000 tons.

Implementation of this plan could impact an estimated 400 acres of wetlands within the area targeted for improvement, or about 1.3 percent of the total wetlands in the Lower Gunnison Unit. Full mitigation for the impacted habitat, estimated to cost \$1,800,000, would require upgrading the habitat value on 900 acres of wetlands elsewhere in the valley undisturbed by implementing this plan.

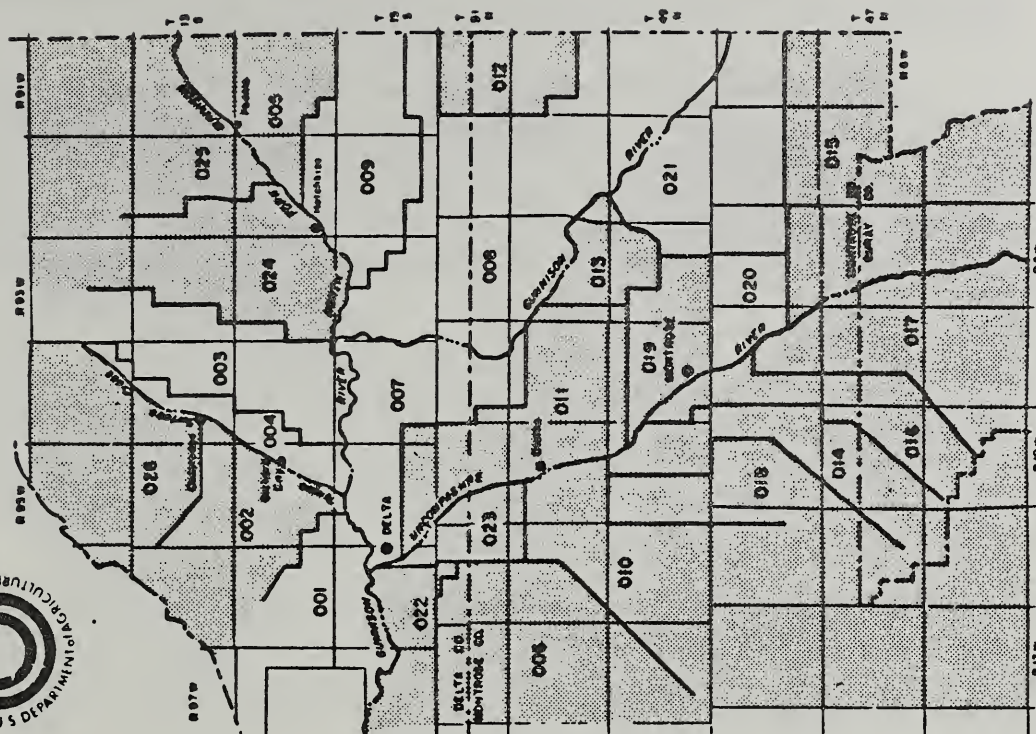
WATERSHED AREAS INCLUDED IN PLAN 4



Plan No. 4
Estimated Quantities and Costs

Item of Work	Units	Quantities	Estimated Cost 1/
Measuring Devices	ea.	1,300	493,000
Ditch Lining	mi.	472	17,210,000
Tailwater Ditch Earth	mi.	0	0
Tailwater Ditch Lined	mi.	0	0
Ditch Structures	ea.	3,750	2,581,000
Pipeline	mi.	255	9,298,000
Pipe Structures	ea.	3,250	2,250,000
Gated Pipe	mi.	114	2,140,000
Land Leveling	ac.	22,600	9,227,000
Closed Drain	mi.	0	0
Automation	ac.	0	0
Subtotal Onfarm Costs			43,199,000
Off-Farm Laterals 2/	mi.	0	0
Subtotal			43,199,000
Off-Farm Laterals 3/	mi.	136	22,001,000
Total Cost			65,200,000

- 1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.
- 2/ Lateral improvements needed for proper operation of onfarm system improvements.
- 3/ Remainder of laterals to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.



☐ INCLUDED
☐ NOT INCLUDED

SCALE:
1" = 12 MI.

Plan Five - Improved Irrigation Water Management and Onfarm Ditch Lining -
Maximum Level - On 41,400 Acres of Selected Area

The plan assumes implementing onfarm ditch lining and improved irrigation water management at the maximum level only for those watersheds having individual economic feasibility based on downstream salinity benefits alone. Included in this plan are 53 miles of small off-farm lateral improvements, the estimated amount needed to assure proper operation of the improved onfarm systems. The irrigated area targeted for improvement is 41,400 acres in Watersheds 1, 3, 4, 7, 8, 9 and 20.

The onfarm portion of the plan can be implemented at a one-time construction cost of \$56,000,000. Technical assistance and administrative costs, estimated to be \$11,200,000, make a total installation cost of \$67,200,000. Including the 82 miles of remaining off-farm lateral adds \$17,400,000 to the construction cost and \$3,500,000 to the cost of technical cost and administration making a total installation cost of \$88,100,000.

The 190,000 ton reduction in salt loading represents a 43 percent reduction in the total salt load being delivered to the Colorado River due to irrigation. Adding the off-farm laterals to this plan will increase the potential salt load reduction by 45,000 tons making a total of 235,000 tons.

Implementation of this plan could impact an estimated 3,100 acres of wetlands within the area targeted for improvement, or about 10 percent of the total wetlands in the Lower Gunnison Basin Unit. Full mitigation for the impacted habitat, estimated to cost \$14,600,000 would require upgrading the habitat value on 7,300 acres of wetlands elsewhere in the valley otherwise undisturbed by implementing this plan.

Plan No. 5
Estimated Quantities and Costs

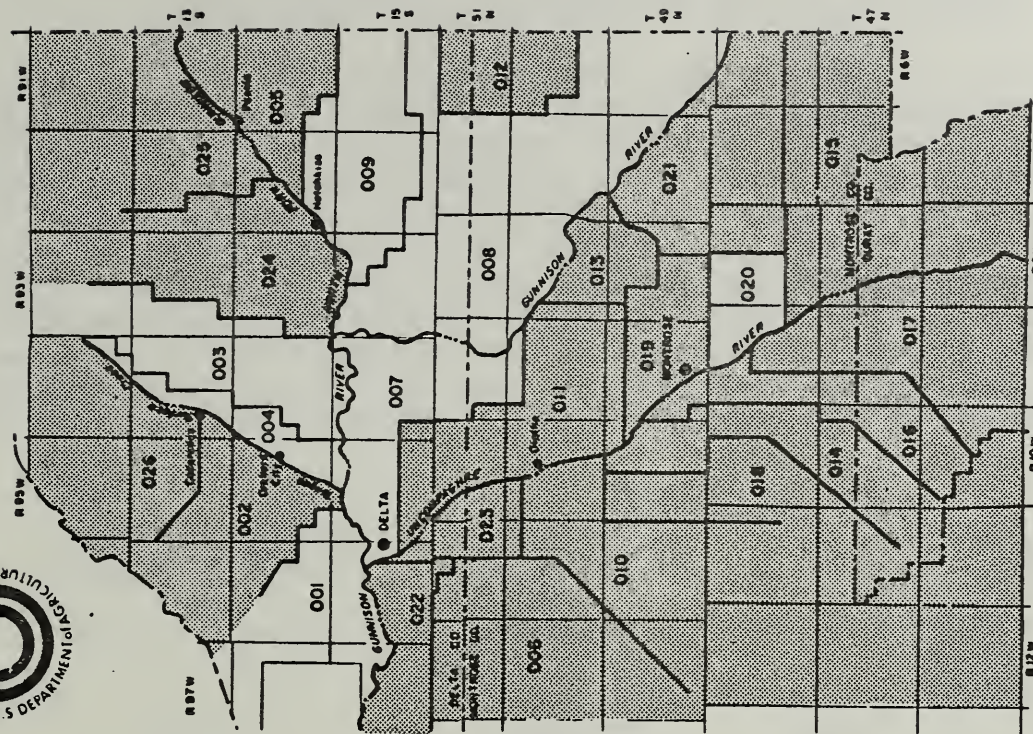
Item of Work	Units	Quantities	Cost 1/
Measuring Devices	ea.	1,000	637,000
Ditch Lining	mi.	264	16,032,000
Tailwater Ditch Earth	mi.	0	0
Tailwater Ditch Lined	mi.	42	1,155,000
Ditch Structures	ea.	1,600	1,090,000
Pipeline	mi.	212	11,556,000
Pipe Structures	ea.	2,600	1,801,000
Gated Pipe	mi.	130	4,813,000
Land Levelling	ac.	25,960	11,554,000
Closed Drain	mi.	31	1,866,000
Automation (Optional)	ac.	13,900	211,000
Subtotal Onfarm Costs			50,715,000
Off-Farm Laterals 2/	mi.	53	5,285,000
Subtotal			56,000,000
Off-Farm Laterals 3/	mi	82	17,400,000
Total Cost			73,400,000

1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.

2/ Lateral improvements needed for proper operation of onfarm system improvements.

3/ Remainder of laterals to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.

WATERSHED AREAS
INCLUDED IN PLAN 5



INCLUDED

NOT INCLUDED

SCALE:
1" = 12 MI.

Plan 6 - Improved Irrigation Water Management and Onfarm Ditch Lining -
Mixed Levels - on 115,500 Acres of Selected Area

This is the plan that tends to maximize net benefits. It assumes implementing improved irrigation water management at the minimum level in four watersheds, implementing improved irrigation water management and onfarm ditch lining at the minimum level in two watersheds, and implementing improved irrigation water management and onfarm ditch lining at the maximum level in ten watersheds. Included in this plan are 50 miles of off-farm lateral improvements, the estimated amount needed to assure proper operation of the improved onfarm systems. Each watershed included in this plan has individual economic feasibility based on total benefits. The indicated level of implementation is the one that produces the highest net benefit. The irrigated area targeted for improvement is 115,500 acres and is in the watersheds tabulated below.

Scope of Improvement	Level of Implementation	Watershed Areas Included in Plan 6	Improvement Area
Irrigation Water Management	Minimum	10, 14, 16, & 23	35,900 acres
Irrigation Water Management & Onfarm Ditch Lining	Minimum	4 & 21	7,900 acres
Irrigation Water Management & Onfarm Ditch Lining	Maximum	1, 3, 7, 8, 9, 11, 17, 19, 20, & 22	71,700 acres

The onfarm portion of the plan can be implemented at a one-time construction cost of \$102,800,000. Technical assistance and administrative costs, estimated to be \$20,600,000, make a total installation cost of \$123,400,000. Including the remaining 85 miles of off-farm lateral improvements with this plan would add \$17,900,000 to the construction cost and \$3,600,000 to the cost of technical assistance and administration making a total installation cost of \$144,900,000.

The 295,000 ton reduction in salt loading due to improvements represents a 67 percent reduction in the total salt load being delivered to the Colorado River from the Gunnison, due to irrigation. Adding off-farm lateral improvements to this plan will increase the potential salt load reduction by 45,000 tons making a total of 340,000 tons.

Implementation of this plan could impact an estimated 5,900 acres of wetland or about 19 percent of the total wetlands in the Lower Gunnison Unit. Full mitigation for the impacted habitat, estimated to cost \$27,400,000, would require upgrading the habitat value on 13,700 acres of wetlands elsewhere in the valley undisturbed by implementing this plan.

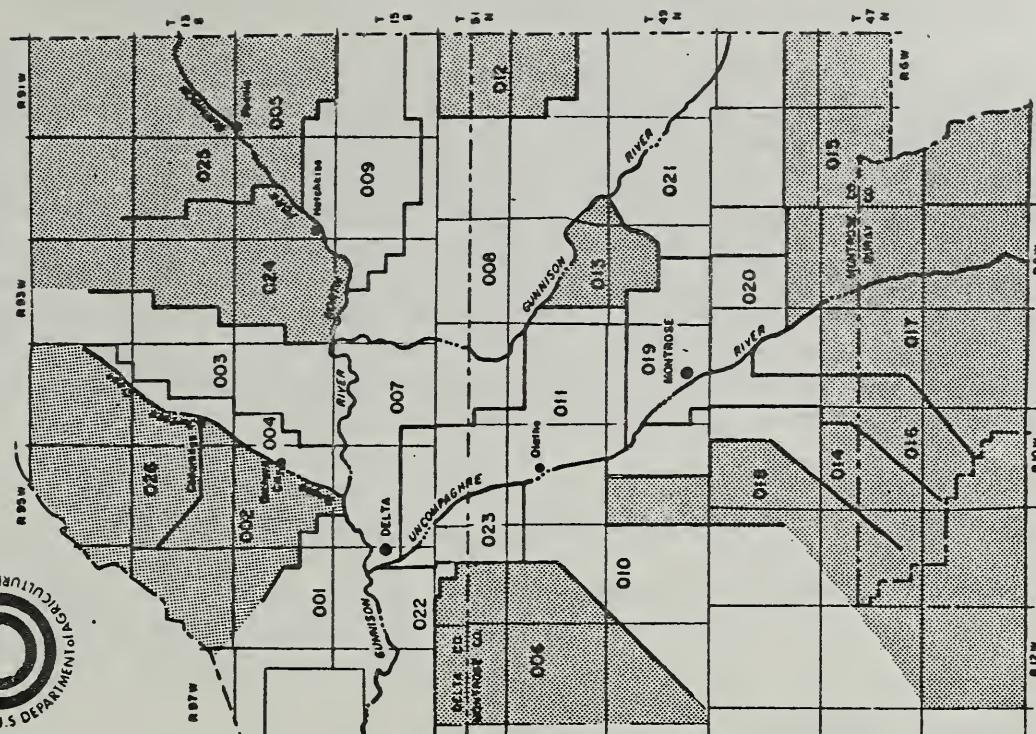
WATERSHED AREAS INCLUDED IN PLAN 6



Plan No. 6
Estimated Quantities and Costs

Item of Work	Unit	Quantities	Cost 1/
Measuring Devices	ea.	4,750	2,319,000
Ditch Lining	mi.	493	27,190,000
Tailwater Ditch Earth	mi.	0	0
Tailwater Ditch Lined	mi.	133	3,643,000
Ditch Structures	ea.	3,800	2,636,000
Pipeline	mi.	405	21,131,000
Pipe Structures	ea.	5,050	3,485,000
Gated Pipe	mi.	340	12,285,000
Land Levelling	ac.	49,300	21,624,000
Closed Drain	mi	49	3,000,000
Automation (Optional)	ac.	24,500	354,000
Subtotal Onfarm Costs			97,667,000
Off-Farm Laterals 2/	mi.	50	5,133,000
Subtotal			102,800,000
Off-Farm Laterals 3/	mi.	85	17,900,000
Total Cost			120,700,000

- 1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.
- 2/ Lateral improvements needed for proper operation of onfarm system improvements.
- 3/ Remainder of laterals to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.



INCLUDED
 NOT INCLUDED

SCALE:
1" = 12 MI.

Plan Seven - Improved Irrigation Water Management and Onfarm Ditch Lining -
Mixed Levels - 169,000 Acres

By combining improved irrigation water management at the minimum level of implementation with improved irrigation water management and onfarm ditch lining at the maximum level this is one plan that maximizes salt load reduction having economic feasibility. This plan includes 109 miles of off-farm lateral improvements needed to assure proper operation of the improved onfarm systems. However, not all watersheds included in this plan have individual economic feasibility, but all watersheds in the valley are included because a greater salt load reduction would be achieved. Watersheds at the respective level of implementation are tabulated below, except that lining the small off-farm laterals in Watersheds 2 and 24, and the large off-farm laterals in Watersheds 5, 7, and 25 is not economically feasible.

Scope of Improvement	Level of Implementation	Watersheds Areas Included in Plan 7	Improvement Area 1/
Irrigation Water Management	Minimum	2, 5, 6, 10, 12, 13, 14, 15, 16, 18, 23, 24, 25 & 26	89,400 acres
Irrigation Water Management & Onfarm Ditch Lining	Minimum	4, 21	7,900 acres
Irrigation Water Management & Onfarm Ditch Lining	Maximum	1, 3, 7, 8, 9, 11, 17, 19, 20 & 22	71,700 acres

1/ Proportionally adjusted to exclude 2,000 acres converted to urban use.

The onfarm portion of this plan can be implemented at a one-time construction cost of \$115,924,000. Technical assistance and administrative costs, estimated to be \$23,740,000, make a total installation cost of \$139,664,000. Including the 54 miles of off-farm laterals in watersheds 1, 3, and 9 with this plan will add \$10,136,000 to the construction cost and \$2,000,000 to the cost of technical assistance and administration making a total installation cost of \$151,800,000.

The 300,000 ton reduction in salt loading represents an 68 percent reduction in total salt load being delivered to the Colorado River. Adding the off-farm laterals to this plan will increase the potential salt load reduction by 35,000 tons making a total of 335,000 tons.

Implementation of this plan could impact an estimated 3,800 acres, or about 10 percent, of wetlands in the Lower Gunnison Unit. Full mitigation for the impacted habitat, estimated to cost \$17,600,000 would require upgrading the habitat value on 8,900 acres of wetlands elsewhere in the valley undisturbed by implementing this plan. There are 33,600 acres of wetlands avoided in this alternative.

WATERSHED AREAS INCLUDED IN PLAN 7



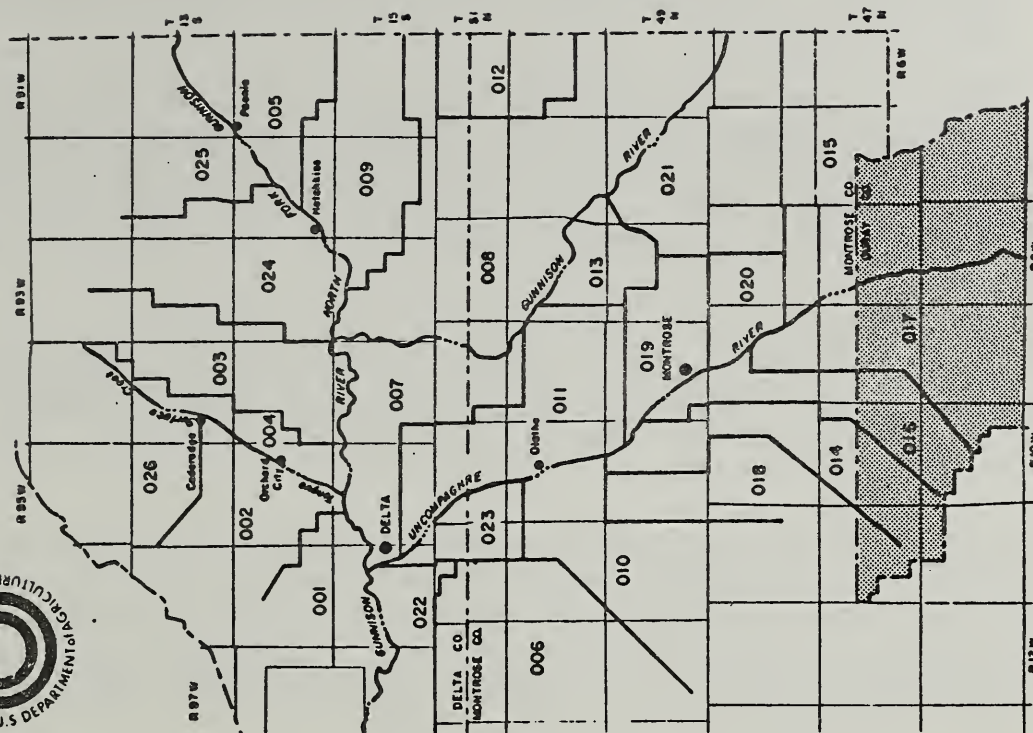
Plan No. 7
Estimated Quantities and Costs

Item of Work	Units	Quantities	Cost 1/
Measuring Devices	ea.	7,360	3,310,000
Ditch Lining	mi.	493	27,190,000
Tailwater Ditch Earth	mi.	0	0
Tailwater Ditch Lined	mi.	133	3,643,000
Ditch Structures	ea.	3,800	2,636,000
Pipeline	mi.	405	21,131,000
Pipe Structures	ea.	5,050	3,485,000
Gated Pipe	mi.	340	12,285,000
Land Leveling	ac.	79,020	33,757,000
Closed Drain	mi.	49	3,000,000
Automation	ac.	24,500	354,000
Subtotal Onfarm Costs			110,791,000
Off-Farm Laterals 2/	mi.	50	5,133,000
Subtotal			115,924,000
Off-Farm Laterals 3/	mi	54	10,136,000
Total Cost			126,060,000

1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.

2/ Lateral improvements needed for proper operation of onfarm system improvements.

3/ Remainder of laterals in watersheds 1,3 and 9 to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.



INCLUDED
NOT INCLUDED

SCALE:
1" = 12 MI.

Plan Eight - Irrigation Water Management and Onfarm Ditch Lining - Maximum Level - Valleywide

The plan assumes implementing irrigation water management and onfarm ditch lining at the maximum level on all irrigated land in the Lower Gunnison Unit except that lining the small off-farm laterals in Watershed 24 which are not needed as an integral part of the onfarm improvements and large off-farm laterals in Watershed 5, 7, 8, and 25 which are not cost effective, and, hence, are not included.

The plan achieves the maximum potential salt load reduction and has overall economic feasibility based on total benefits although not all watersheds are individually feasible. Included in this plan are 109 miles of off-farm laterals, the estimated amount needed to assure proper operation of the improved onfarm systems.

The onfarm portion of this plan can be implemented at a one-time construction cost of \$240,500,000. Technical assistance and administrative costs, estimated to be \$48,100,000, make a total installation cost of \$288,600,000. Including 100 miles of off-farm lateral improvements adds \$19,500,000 to the construction cost and \$3,900,000 to the cost of technical assistance and administration making a total installation cost of \$312,000,000.

The 370,000 ton reduction in salt loading represents an 84 percent reduction in total salt load being delivered to the river. Adding the off-farm laterals to this plan will increase the potential salt load reduction by 50,000 tons making a total of 420,000 tons.

Implementation of this plan could impact an estimated 13,200 acres, or about 35 percent, of wetlands in the Lower Gunnison Basin Unit. Full mitigation for the impacted habitat, estimated to cost \$44,100,000, could require upgrading the habitat value on the 18,300 acres of wetlands elsewhere in the valley otherwise undisturbed by implementing this plan plus developing new wetland habitat on 3,700 acres elsewhere.

Additional Alternatives

Categorical retirement of 12,000 acres of irrigated land in the valley, first suggested by the USBR at a public meeting, was eliminated from further consideration because of opposition by the local people. Agriculture is the major economic force in the valley and a land retirement alternative suggests the complete loss of this sector of the economy.

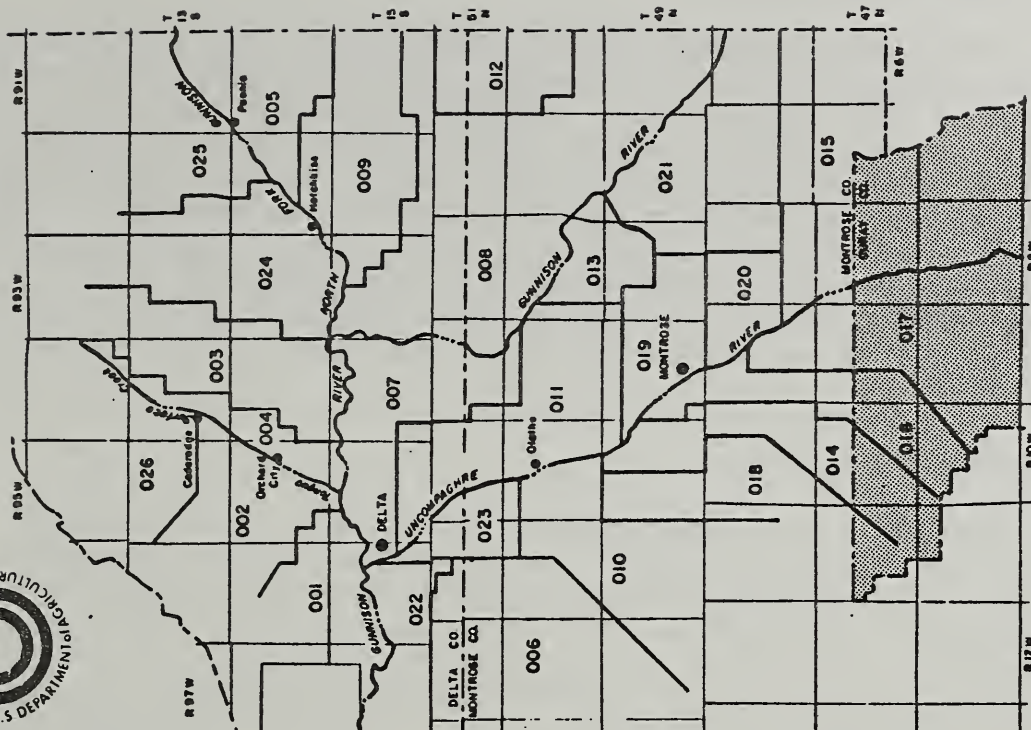
Selective retirement of irrigated land is an option for use with the other alternatives. However, specific areas to be retired have not been identified at this stage of planning. Criteria for selective land retirement include salinity contribution, cost of onfarm and off-farm improvements relative to land values, crop yields, and suitability of retired land as a replacement for lost wetlands. Site specific recommendations for land retirement will be made during detailed planning for implementation when actual costs of improvement can be compared with current land values and onfarm benefits.



WATERSHED AREAS INCLUDED IN PLAN 8

Plan No. 8
Estimated Quantities and Costs

Item of Work	Unit	Quantities	Cost 1/
Measuring Devices	ea.	5,600	3,626,000
Ditch Lining	mi.	1,257	76,311,000
Tailwater Ditch Earth	mi.	0	0
Tailwater Ditch Lined	mi.	231	6,322,000
Ditch Structures	ea.	11,100	7,673,000
Pipeline	mi.	865	47,253,000
Pipe Structures	ea.	11,600	7,977,000
Gated Pipe	mi.	713	26,399,000
Land Leveling	ac.	97,920	43,579,000
Closed Drain	mi.	133	8,056,000
Automation (Optional)	ac.	56,300	663,000
Subtotal Onfarm Costs			227,859,000
Off-Farm Laterals 2/	mi.	109	12,641,000
Subtotal			240,500,000
Off-Farm Laterals 3/	mi.	100	19,500,000
Total Cost			260,000,000
1/ July 1980 price base. These costs include 15% contingency but not technical assistance or administrative costs.			
2/ Lateral improvements needed for proper operation of onfarm system improvements.			
3/ Remainder of laterals to be improved for salinity control. Note that improvement of all laterals is not intended under the Salinity Control Program.			



INCLUDED
 NOT INCLUDED
 SCALE:
 1" = 12 MI.

Recommended Plan

Plan 7 is recommended for implementation. This plan was selected after considering local reaction from reviewing the eight candidate plans at public meetings with farmers and ranchers in the valley and after considering comments on the draft report received from officials of local, state and federal agencies and with other interested groups. Major factors influencing the selection include the desires of local landowners and operators, cost effective salinity reduction, overall implementation cost, and program administration. Program implementation will extend over a ten year period. Effectiveness of the program should be monitored and the data evaluated at three year intervals to determine whether the improvements are achieving the expected degree of salinity reduction.

Plan Description

Irrigation water management, consisting of close precision in controlling the time of set and the flow rate per furrow during each irrigation, supplemented by installing water measuring devices and leveling of irrigated fields comprise the minimal level of improvement needed in Watersheds 2, 4, 5, 6, 10, 12, 13, 14, 15, 16, 18, 21, 23, 24, 25, and 26 (see Table IV-2). Onfarm ditch lining in addition to the minimum level of improvement is cost effective and will be included in watersheds 4 and 21. Intensive treatment, consisting of irrigation water management and the practices listed in Table IV-2, have been identified as cost effective and needed in watersheds 1, 3, 7, 8, 9, 11, 17, 19, 20, and 22 to achieve objectives of the salinity control program. Improvement of off-farm laterals in watersheds 1, 3, and 9 not needed for proper operation of onfarm system improvements is also included. The cost for implementing the recommended plan, together with the expected reduction in salt loading, are based on strict adherence to implementing those improvements listed in Table IV-2 only in the respective watershed areas.

When completed implementation of the recommended plan will result in a 335,000 ton per year reduction in salt loading, about a 52 percent reduction in the 640,000 ton salt load delivered annually to the Colorado River from irrigation sources in the Lower Gunnison Basin.

The estimated total installation cost is \$169,400,000. Of this amount \$110,911,000 is the construction cost for onfarm improvements (including \$120,000 for voluntary implementation of mitigation practices), \$15,269,000 is the construction cost for 104 miles of off-farm lateral improvements, \$25,740,000 is the cost of administrative and technical assistance, and an additional \$17,600,000 is needed if full mitigation for the loss of habitat values is required. After the recommended plan is fully implemented the annual local cost for operation, maintenance and replacement is estimated to be \$800,000. The average annual cost including operation, maintenance and replacement is \$22,460,000, expressed in present value terms. The present value of benefits is \$31,490,000 giving average annual net benefits of \$9,030,000.

Implementation of this plan will impact on 3,800 acres or 10 percent of the wetlands in the Lower Gunnison Basin. Full mitigation for the impacted habitat, estimated to cost \$17,600,000, would require upgrading the habitat value on 8,900 acres of wetlands elsewhere in the valley not otherwise disturbed by implementing this plan.

TABLE IV-2 ESTIMATED QUANTITIES AND COSTS FOR IMPLEMENTING
THE RECOMMENDED PLAN
Lower Gunnison Salinity Control Study, Colorado

Item of Work	Units	Level of Improvement				Total	
		Intensive 1/		Minimal 2/		Quantity	Cost 5/ (\$1000)
		Quantity	Cost 5/ (\$1000)	Quantity	Cost 5/ (\$1000)		
Measuring Devices	ea.	1,920	1,241	5,440	2,069	7,360	3,310
Ditch Lining:							
Head Ditches	mi.	379	23,047	114 3/	4,143	493	27,190
Tailwater Ditches	mi.	133	3,643	0	0	133	3,643
Ditch Structures	ea.	2,560	1,780	1,240 3/	856	3,800	2,636
Pipeline	mi.	352	19,185	53 3/	1,946	405	21,131
Pipe Structures	ea.	4,390	3,030	660 3/	455	5,050	3,485
Gated Pipe	mi.	323	11,962	17 3/	323	340	12,285
Land Leveling	ac.	41,700	18,109	37,300	15,648	79,000	33,757
Closed Drains	mi.	49	3,000	0	0	49	3,000
Semi-automated Systems	ac.	24,500	354	0	0	24,500	354
Shallow Water Areas 4/	ac.	30	36	70	84	100	120
Subtotal Cost	-	---	85,398	---	25,534	---	110,932
Off-Farm Laterals	mi.	104	15,269	0	0	104	15,269
Total Cost	-	---	100,667	---	25,534	---	126,201

1/ Intensive treatment limited to watersheds 1,3,7,8,9,11,17,19,20 and 22.

2/ Minimal treatment limited to watersheds 2,5,6,10,12,13,14,15,16,18,23,24,25 and 26. Note that watersheds 4 and 21 are to receive minimal treatment plus onfarm ditch lining.

3/ Installation of these practices will be limited to watersheds 4 and 21 only.

4/ Estimated extent of voluntary implementation of practices for mitigating wetland losses under existing authority.

5/ July 1980 price base. Costs include 15 percent contingency but not technical assistance or administrative costs.

Level of Federal Funding

Federal cost-share rates to implement the recommended plan should be not greater than 75 percent. This 75 percent cost-share rate requires \$137,885,000 in federal funds over the 10-year period, consisting of \$94,545,000 cost-share assistance for construction, \$25,740,000 for administrative and technical assistance and \$17,600,000 to fully mitigate habitat losses.

Annual levels of funding and total costs for the 10-year installation period are shown in Table IV-3.

TABLE IV-3 ANNUAL LEVELS OF FUNDING NEEDED FOR IMPLEMENTATION
LOWER GUNNISON SALINITY CONTROL STUDY, COLORADO

Year	Construction		Admin. & 1/ Technical Local			Total	Total	Total
	Federal	Local	Assistance	O&M	Mitigation	Federal	Local	Cost
	-----\$1,000-----							
1	9,045	2,715	1,890	80	1,000	11,935	2,795	14,730
2	9,500	3,200	2,650	160	1,825	13,975	3,360	17,335
3	9,500	3,200	2,650	240	1,825	13,975	3,440	17,415
4	9,500	3,200	2,650	320	1,825	13,975	3,520	17,495
5	9,500	3,200	2,650	400	1,825	13,975	3,600	17,575
6	9,500	3,200	2,650	480	1,825	13,975	3,680	17,655
7	9,500	3,200	2,650	560	1,825	13,975	3,760	17,735
8	9,500	3,200	2,650	640	1,825	13,975	3,840	17,815
9	9,500	3,200	2,650	720	1,825	13,975	3,920	17,895
10	9,500	3,200	2,650	800	2,000	14,150	4,000	18,150
Total	94,545	31,515	25,740	4,400	17,600	137,885	35,915	173,800

1/ Includes \$280,000 annually to continue the Irrigation Research Program by ARS, USDA.

The implementation program needed to significantly reduce salt loading requires accelerated application of conservation practices pertinent to salinity control and the cooperative effort of federal, state and local agencies, and private organizations. To achieve full potential reduction, two conditions must be satisfied. First, recommended irrigation water management practices must be followed to a high degree of precision; and, second, all recommended improvements in the irrigation system must be installed.

Seven actions have been identified as being essential to a successful implementation program. These are:

1. Authorize a level of federal funding that provides incentive for voluntary and continued participation of the farm operators to achieve early completion of the recommended plan to reduce salinity.
2. Establish a local salinity control coordinating committee and follow implementation priorities established by that committee so those areas contributing the highest salt load will be treated first.

SCS
mitigation

3. Provide increased technical assistance by SCS through the Delta and Shavano Soil Conservation Districts and by ASCS county offices to service the expected accelerated workload.
4. Develop a conservation plan that includes an environmental evaluation for each farm containing conservation practices consistent with priorities by watershed area and reflecting the owner's decisions for making improvements to meet objectives of the salinity control program.
5. Obtain a long-term commitment from farm operators to begin an improvement program based on individual conservation plans and to accelerate that program consistent with established priorities for early completion of needed improvements.
6. Continue the program for irrigation research to determine applicability and limitations of various irrigation methods under local conditions of soil, climate, crops and economics.
7. Initiate a program to monitor and evaluate the effectiveness of onfarm improvements to verify that objectives of the salinity control program have been achieved.

Nondiscrimination

The salinity control program will be implemented in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Law of 1964, as amended, and the regulations of the Secretary of Agriculture (CFR 15.1-15.12), which provide that no person in the United States shall, on the grounds of race, color, religion, national origin, sex, age, physical or mental handicap be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.

Mitigation

Each alternative plan (Table A1-4) for the Lower Gunnison Basin Unit has a display of the potential wetland loss. This is shown in acres and in Habitat Value Units. The significance of the wetland impacts are given in perspective by showing: (1) the wetlands avoided in each alternative; (2) the wetlands that could be upgraded (rehabilitated); and (3) additional wetlands needed (replacement). In addition, the wetland loss in each alternative is evaluated to display the replacement cost (at \$2,000/acre) to upgrade (rehabilitate) wetlands by increasing the habitat value of otherwise undisturbed wetlands elsewhere in the valley. In most instances proper control of grazing by domestic livestock will allow natural rebound of native vegetation. In some areas reseeding of native species may be needed. The revitalized vegetation could adequately minimize the adverse effects on habitat values lost due to program implementation.

It is anticipated that the most likely scenario for mitigation is a voluntary commitment on individual or contiguous farms. This commitment could result in an acreage with habit unit value which is less than the full level of mitigation by avoiding areas, upgrading (rehabilitation), or replacement. It is estimated that 100 acres of wetlands obtained through voluntary mitigation will partially replace lost wetlands in the recommended plan. In addition the recommended

provides 33,600 acres of wetlands. USDA will make every effort to work with operators to include wildlife practices in their conservation plan. A Memorandum of Understanding between the Soil Conservation Service and the Agricultural Stabilization and Conservation Service is being negotiated. That agreement could establish that cost sharing for salinity control practices is conditional on the farmer installing, with available cost sharing, those salinity control and associated wetland and wildlife practices in the conservation plan of operations. Such a memorandum already exists for the Uintah Basin in Utah.

At the present time wetland losses resulting from USDA activities in the Salinity Control Program in the Uintah Basin are being minimized by including wildlife conservation practices in the conservation plan for the individual farms. Conservation measures for salinity control are being applied only on those lands which have been cultivated for four of the last five years, and wetlands are not being drained to convert them to other uses. The wildlife practices are available at a 75 percent cost share rate on long-term agreements. The USDA agencies will be working with the state divisions of wildlife and with the U.S. Fish and Wildlife Service in the development of the individual conservation plans.

A second mitigation scenario would be for the USDA wetland mitigation to be included in the off-farm mitigation plan, and therefore be included in the USBR report, which will eventually be submitted to the Congress for authorization and funding. However, there is no present plan for such an arrangement.

A third mitigation scenario, which is outside the jurisdiction and present authority of USDA, would be for Congress to fund USDA wetland mitigation for the plan to be implemented at the time Congress approves the ASCS, Agricultural Conservation Program, or other funding for the salinity control practices. The funding, estimated at \$17,600,000 for full mitigation, could be tied to the levels of habitat improvement shown in Table A-1-4. It would be desirable to develop blocks of land (purchased or obtained by wildlife easement) for wildlife use rather than on the individual farms or on contiguous farms where the salinity control practices are being installed. However, this would also require additional authorities if ASCS was to handle the cost sharing and provisions for operation and maintenance. Public ownership or management by lease or other arrangements for those wetlands that could be upgraded, as shown in the alternatives, may be necessary to assure adequate development and long life of such areas for mitigative purposes. It would be necessary to overcome the problems of water rights, operation and maintenance and taxation of the wetlands devoted to mitigation.

Conflicts

The concept of mitigating for loss of wetland habitat and of reducing the salt load carried by the Colorado River present a possible conflict between environmental values. The Colorado River Basin Salinity Control Act, Public Law 93-320, firmly establishes that the purpose of salinity studies is to develop alternative actions to reduce the salt load carried by the Colorado River. Much of the salt load is attributed to the irrigation systems and practices throughout the valley. These same irrigation systems and practices are the source of water for some wetlands in the valley. As seepage from the irrigation systems is reduced and as irrigation efficiency is increased, these irrigation induced wetlands will be unavoidably lost. Each alternative plan

considers the significance of this loss by displaying the dollar cost to fully mitigate the loss and by showing the loss as a percentage of the total habitat value in the valley.

In contrast there is a basis for wetland protection and mitigation established in the regulations for compliance with N.E.P.A., Executive Order 11990, and USDA policy. Therefore, the concept of mitigation for loss of wetland habitat and of reducing the salt load carried by the Colorado River presents the conflict between the environmental values of improved water quality versus wetland loss.

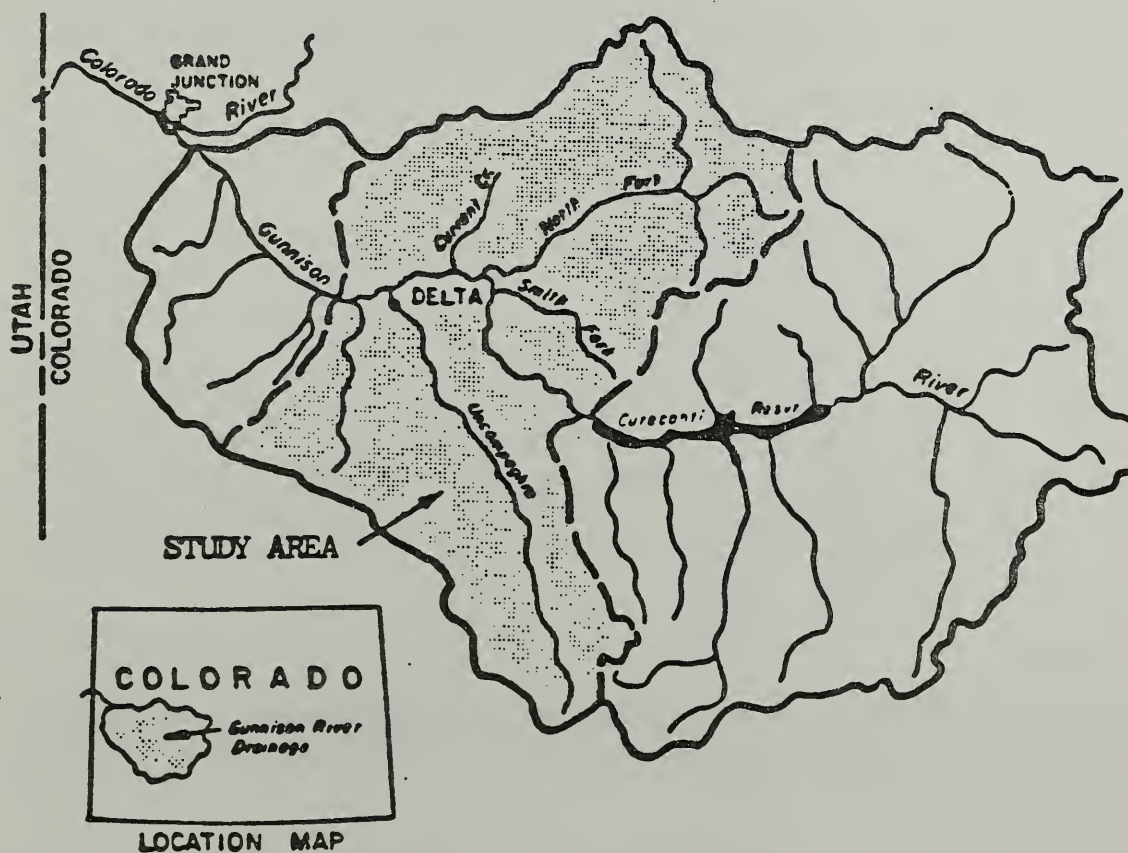
The Soil Conservation Service was aware of the conflict between the competing environmental values of water quality and irrigation induced wetlands when it developed its wetland policy (7 CFR 650.26) in compliance with Executive Order 11990. As a result, the SCS wetland policy was written to allow for certain policy exceptions if necessary to meet identified irrigation water management (water quality and water conservation) objectives. However, as previously indicated, SCS will make every effort to work with cooperators to include wildlife practices in their conservation plans.

C. Affected Environment

Location

The Lower Gunnison Basin Unit in west central Colorado (Figure IV-1) includes all or major portions of Montrose, Delta, Gunnison, and Ouray Counties.

FIGURE IV-1. GUNNISON RIVER DRAINAGE
LOWER GUNNISON SALINITY CONTROL STUDY, COLORADO



The area consists of several intermountain valleys and mesas drained by the Uncompahgre and the Gunnison Rivers and their tributaries. The Continental Divide through the Elk Mountains and the Cimarron Ridge form the area's east and southeast boundaries. The Grand Mesa forms the north boundary. The Uncompahgre Plateau and the San Juan Mountains comprise the west and south boundaries, respectively.

Physiography and Geology

The Lower Gunnison Unit contains two million acres. About 42 percent of this area is privately owned and consists of 182,500 acres of irrigated cropland including the 171,000 acres within the study area, and 663,500 acres of nonirrigated rangeland. The irrigated land, mostly within the 0-2 and 2-5 percent slope groups, developed from alluvium, glacial outwash and shale. Forest land managed by the U.S. Forest Service makes up 36 percent of the area and is considered a low producer of salts and sediment. Rangeland, highly susceptible to erosion, managed by the Bureau of Land Management, comprises 22 percent of the area.

Mancos shale underlies most of the valley surrounded by older Dakota sandstone and younger volcanic rock as shown in Figure IV-2. The Mancos formation, a marine shale with high salt content, consists mainly of gray silty clay. It is the principal source of salt in the Lower Gunnison Unit. Salts are concentrated in certain areas within the shale and the younger alluvial deposits. Lenses of crystalline salt often are exposed during excavation into shale.

Elevation in the area ranges from 4,550 feet above mean sea level where the Gunnison River joins the Colorado River, to 14,300 feet on Uncompahgre Peak in the southern end of the basin. Because of the arid climate below about 7,000 feet elevation, salts have not been leached naturally from the soil. The leaching process is greatly accelerated by applying irrigation water to these salt laden soils.

Notable sites of scenic importance within the project area include Box Canyon, the San Juan Mountains, Young's Peak--a chimney rock near Crawford--and the Black Canyon of the Gunnison River.





Climate

The mean annual temperature at Delta is 51°F and ranges from a mean maximum temperature for July of 94°F to a mean minimum temperature for January of 14°F. The mean annual temperature for all Lower Gunnison weather stations is 49.6°F. The average annual precipitation at Delta is 8 inches and 9 inches at Montrose. About one half is in the form of winter snow. The average length of the growing season is 146 days near Delta with elevation of 4,960 feet above mean sea level and 152 days at Montrose, elevation 5,800. The estimated length of growing season at Crawford and other locations at higher elevation is about 105 days. The area below 6,200 feet elevation is characterized by low precipitation, low humidity, abundant sunshine, and a wide range in annual and daily temperatures.

Water Supply

Projects built by the Bureau of Reclamation supply water to 99,000 acres, 54 percent of the irrigated land in the valley. The largest, the

LEGEND

-  AREAS WHERE MANCOS SHALE AND YOUNGER ALLUVIAL DEPOSITS MAY CONTRIBUTE TO THE SALT LOAD FROM SURFACE RUNOFF OR IRRIGATION RETURN FLOW.
-  OLDER ALLUVIAL DEPOSITS
-  LANDSLIDE DEPOSITS, ECT.
-  OLDER SEDIMENTARY ROCKS AND YOUNGER VOLCANIC ROCKS.

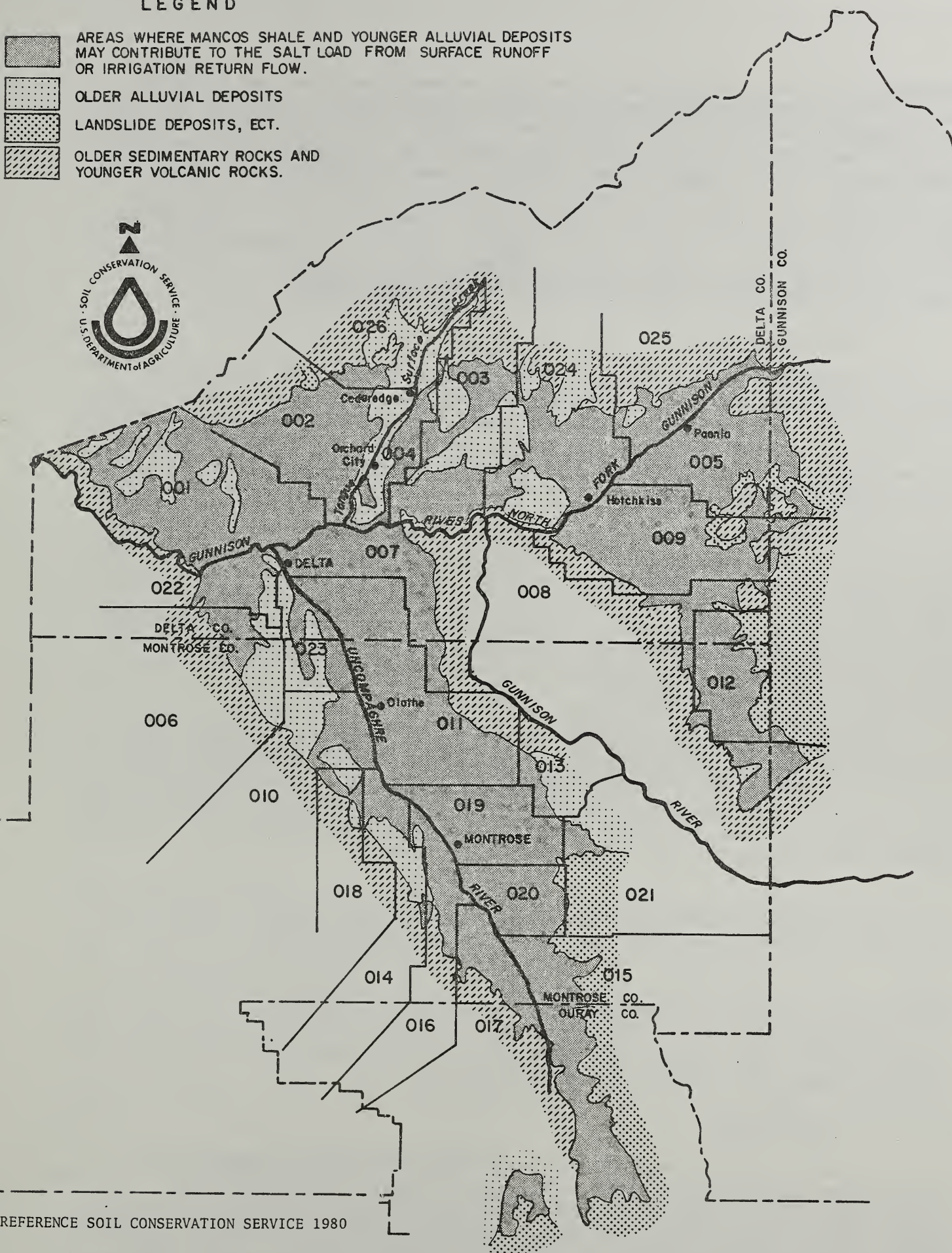


FIGURE IV-2
GENERALIZED GEOLOGIC MAP
LOWER GUNNISON SALINITY CONTROL STUDY,
COLORADO

Uncompahgre Project, diverts water from the Uncompahgre River and from the Gunnison River through the seven mile long Gunnison Tunnel completed in 1908. The Uncompahgre is a full service project. Taylor Dam and Reservoir, completed in 1929, stores water for late season use within the Uncompahgre Project area. Other projects for irrigation water supply include the Fruitgrowers Dam, the Paonia Project, the Smith Fork Project, the Bostwick Park Project, and the Dallas Creek Project wherein the Ridgeway Dam currently is under construction. Water for the balance of the irrigated land is supplied by numerous private and group ditches and storage reservoirs, which depend on direct runoff and cannot be relied upon to meet late season water requirements.

Salt Sources

Analysis of water quality data collected by the U.S. Geological Survey (USGS) indicates that the Lower Gunnison River contributes about 1.44 million tons of salt annually to the Colorado River. Most of these salts are leached from the soil and underlying Mancos shale and carried into the river by deep percolation from irrigation application and by seepage from water delivery and tailwater collection systems.

Both natural runoff and irrigation contribute to the problem, by salt concentration and by salt loading. Salt concentration is caused by removal of water from the river system through consumptive use by irrigated crops and other vegetation, and by evaporation; mineral constituents are concentrated in the water that remains. Salt loading occurs as ground water dissolves subsurface minerals while flowing through the salt laden shale layers. Although both salt concentration and salt loading are at work, salt loading is the major cause of the salinity increase.

Salt loading from irrigated cropland is related to subsurface return flows. Most fields are irrigated in excess of normal crop needs and deep percolation of excess irrigation water causes substantial return flows through layers of Mancos shale that contain large quantities of undissolved salts (solids). The concentration of dissolved salts transferred to the percolating water seriously degrades the quality of water returning to the Colorado River system.

Of the 1.44 million tons of salt delivered annually to the Colorado River from the Gunnison some 600,000 tons come from natural sources, about 440,000 tons from onfarm irrigation systems and practices, and about 400,000 tons from off-farm canals and laterals (See Table IV-4). The salt load from onfarm sources can be reduced by as much as 335,000 tons (76 percent) depending on which alternative plan is implemented. An additional reduction of 50,000 tons can be attained by lining 109 miles of smaller off-farm laterals. Lining another 100 miles of the off-farm laterals, while not cost effective, would achieve an additional 115,000 ton reduction.

Salt Loading

Salt pickup through deep percolation from field irrigation, and seepage from onfarm ditches account for salt loading. Irrigation water delivered to the farms has an average salt concentration of 260 milligrams per liter (mg/l). Base flows returning to the river in the drains and washes have mineral concentrations ranging from 175 to 7650 mg/l with an average of 2650 mg/l. Salts are concentrated in soil moisture as plants extract water and minerals

needed for growth. Excess irrigation water lost through deep percolation, seepage from onfarm delivery ditches, and seepage from tailwater collection ditches increases the total salt load by passing through the saline soil and shale formation and resurfacing at the deeper manmade drains and natural washes

TABLE IV-4
SUMMARY OF SALT LOADING AND POTENTIAL REDUCTION
ATTRIBUTED TO IRRIGATED AGRICULTURE IN THE LOWER GUNNISON BASIN UNIT ^{1/}

Source	Length of Lateral (miles)	Salt Loading	
		Quantity	Potential Reduction
		(-----tons/year-----)	
Onfarm:			
Head Ditch Seepage	-	210,000	160,000
Deep Percolation	-	135,000	115,000
Tailwater Ditch Seepage	-	95,000	60,000
Subtotal Onfarm	-	440,000	335,000
Off-farm ^{1/}			
Small Laterals ^{2/}	135	25,000	20,000
Large Laterals ^{3/}	210	110,000	90,000
Main Canals ^{4/}	140	65,000	55,000
Subtotal Off-farm	485	200,000	165,000 ^{5/}
Total	485	640,000 ^{1/}	500,000

- ^{1/} Does not include data for laterals within the Uncompahgre Project Area being studied by the USBR which contribute about 200,000 tons annually.
^{2/} Small laterals carry flow rate less than 20 cubic feet per second (cfs).
^{3/} Large laterals carry flow rates between 20 and 100 cfs.
^{4/} Main canals carry flow rate greater than 100 cfs.
^{5/} Reduction of this magnitude is not cost effective.

that ultimately convey the excess water back to the river. Flow in these drains occurs near the groundwater level, so essentially no seepage losses occur from the deep drains and washes.

Volume of ditch seepage and deep percolation, determined for each of 26 drainage areas, was used to calculate the salt load from each area. Although average deep percolation is nearly constant, ranging from 0.8 to 1.5 acre-feet per acre per year, the salt load from each area varies considerably, ranging from 0.1 to 9.6 tons per acre per year. This range in salt loads suggest examining the total salt load from each drainage area and setting priorities for treatment.

Present Land and Water Uses

Irrigated agriculture is well suited to the area. Three primary crop groups comprise the major agricultural activities (See Table IV-5). Pasture and livestock feed crops occupy about 55 percent (92,300 acres) of the area, small grains and row crops are grown on about 39 percent (66,700 acres) and fruit orchards and other crops occupy about 6 percent (12,000 acres).

TABLE IV-5 PRESENT IRRIGATED CROPPING SYSTEM ^{1/}
LOWER GUNNISON SALINITY CONTROL STUDY, COLORADO

Crop	Delta County		Montrose County		Totals	
	Acres	Percent	Acres	Percent	Acres	Percent
Livestock Feed:						
Alfalfa Hay	14,700	17	17,900	21	32,600	19
Grass Hay	18,300	21	8,600	10	26,900	16
Pasture	19,400	23	12,400	15	31,800	19
Other	600	1	400	-	1,000	1
Subtotal	53,000	62	39,300	46	92,300	55
Grain and Row Crops:						
Corn	8,600	10	16,000	19	24,600	14
Small Grain	10,000	12	20,300	24	30,300	18
Other	4,400	5	7,400	9	11,800	7
Subtotal	23,000	27	43,700	52	66,700	39
Orchard:						
Apples	5,600	7	300	-	5,900	3
Other	1,800	2	100	-	1,900	1
Subtotal	7,400	9	400	0	7,800	4
Other	2,100	2	2,100	2	4,200	2
TOTALS	85,500	100	85,500	100	171,000	100

^{1/} Based on 1978 Field Inventory.

^{2/} Does not include 16,800 acres in Ouray County.
Rounded to closest 100 acres.

Distribution of these crops is not expected to change, but, crop yields may increase with improved technologies. Of the irrigated land, about 48 percent (88,000 acres) is classified as well suited to cultivation. Pasture and animal feed crops that tend to provide durable ground cover can be grown in the remainder of the area.

Furrow irrigation is expected to remain the principal irrigation method, with implementation of border, sprinkler and drip systems occurring where applicable and as these methods gain acceptance among farm operators. About 828,000 acre-feet of water is delivered annually to the many farms in the valley for crop irrigation. In addition, small streams of water flow through some canals throughout the year to provide water for livestock.

Expansion to accommodate the estimated 2 percent per year growth in population will encroach on about 2,000 acres of irrigated land during the next 25 years. Agriculture will, however, continue as the primary component of the area's economy. There are approximately 2,000 farms irrigating the 171,000 acres of crops and pastureland in the valley.

Social and Economic Characteristics

The Lower Gunnison area was first explored, but not settled, by the Spanish. In 1873, the Ute Indians ceded the upper basin to the federal government and settlement started almost immediately. Captain Gunnison explored much of the area in 1881 searching for a feasible railroad route across the Continental Divide. Since 1882, when a railroad and the first irrigation ditches were built in the valley, irrigation progressed to where there are now 170,900 irrigated acres in the Lower Gunnison study area. Principal crops include alfalfa hay, grass hay pasture, small grains, corn and orchard.

Principal towns are Montrose and Delta, with six smaller communities also located in the area. Due to the nation's need for the energy resources in the area, Delta County is expected to grow more in the next 10 years than Montrose County.

The area has a present year-round population of approximately 45,000 people, in 3,148 square miles, or a population density of 14 people per square mile. If present trends continue, the population will increase about 2 percent per year. With a salinity control program, population may increase at a slightly higher rate. Expected coal gasification activity will significantly increase population growth during the next 10 years.

Migration slightly increases the area's population during the summer and fall as vacationing people and hunters visit the area for scenic and recreation attractions, and living in summer homes. No effect on the tourism and hunting (principally big game) is anticipated with the proposed irrigation improvements.

The population largely is white Caucasian ^{1/} (96 percent) including those of Spanish origin (9 percent of the population). In the rural agricultural area, less than 4 percent of the residents are of Spanish descent. There are less than 500 black, oriental and American Indian residents in the area, and no localized settlements of any ethnic group in the rural area.

The 1970 Census of Population ^{2/} reports median family income in the area ranges between \$7,000 and \$10,000 per year. In the study area, 15 percent of the households are below the poverty level, 55 percent earn between \$3,000 and \$10,000 a year and 30 percent earn more than \$10,000 per year. The largest earnings by economic sector are local, county, state and federal government; agriculture; wholesale and retail trade; mining; and services.

The largest employer in the project area was the wholesale and retail trade sector which employed almost one out of five working people in the region. A close second, with 19 percent of those employed, was the professional and related services sector. The agriculture, forestry and fisheries sector was also a major employer in the region with 16 percent of all employed. Together, these three sectors employed 55 percent of the working population.

The other major employing sectors in descending order are mining, construction, transportation-communication-utilities, and public administration.

^{1/} Advance Reports, 1980 Census of Population and Housing, Bureau of the Census, U.S. Department of Commerce.

^{2/} Bureau of the Census, U.S. Department of Commerce.

Current estimates indicate a gradual growth in the overall number of jobs in the project area. Employment trend estimates perceive that the number of jobs in agriculture will decline. All other sectors are expected to increase. The top employing sectors are expected to be wholesale-retail trade, services, government, mining and construction.

Historical and Archeological Resources

An archeological survey done under contract to the Colorado Division of Highways near the area indicates the possibility of many sites of archeological and historical importance within the general study area. However, there are no known historical or archeological sites that will be affected by the proposed salinity control work, which will occur in areas already disturbed by agricultural activities. It is recognized, that the area has been occupied at various times in the past and there is a possibility that cultural resources may be discovered when working in previously undisturbed soils. The Colorado State Historic Preservation Office has had discussion with the SCS to expedite both evaluation and excavation of any sites discovered during construction for the alternative implemented. Construction should be stopped for a maximum of 48 hours to provide opportunity for a SHPO archeologist to observe the site, and to advise the landowner as to potential eligibility for the National Register of Historic Places. In addition, after construction is stopped the Secretary of the Interior will be notified through the Departmental Consulting Archeologist, Interagency Archeological Services (IAS), Washington, D.C. 20243, (202) 343-7105. IAS will then initiate investigation within 48 hours to determine any necessary data recovery pursuant to the Advisory Council on Historic Preservation Regulations (36 CFR 800) and Soil Conservation Service Regulations (7 CFR 656).

Wildlife Resources

Wetlands are an important part of the total wildlife habitat in the Lower Gunnison River basin. Wetlands comprise about 12 percent of the total study area, and are important because of high vegetation and wildlife diversity, dispersion and productivity.

Historically, broad river bottoms and adjacent drainages probably supported extensive riparian woodlands, large, dense willow stands and extensive cattail marshes. Some open water, generally surrounded or interspersed with cattails, was present in oxbows and sloughs. Five important wetlands frequently mentioned in early descriptions are the Uncompahgre river bottom, the Gunnison river bottom, Happy Canyon, Spring Creek and Dry Creek. These wetlands supported high populations of deer, waterfowl and small game; important sources of food and clothing for Indians and early settlers.

Agricultural, residential and industrial development over the past 100 years have had an impact on these wetlands. Fertile river bottom land has been drained and cleared for cropland and livestock grazing has altered or destroyed the understory in the stands that remain.

Agricultural development has also created new wetland habitat, counteracting somewhat the loss of historic wetland habitat. The Gunnison Tunnel introduces additional water into the Lower Uncompahgre River basin that irrigates crops,

and supports valuable wetland habitat. Water seeps from earthen canals and ditches, often saturating the soil and supporting such hydrophytic and phreatophytic plants as cattails, rushes, willows and cottonwoods. Open drains often support dense stands of reed canarygrass, willows and tamarisk. Return flows from irrigated areas contribute water to natural drainages, supporting native wetlands or creating new ones. Irrigation induced or increased wetlands, including single and multiple water source wetlands, constitute almost 38 percent of the total wetland habitat in the study area.

The small mammal and bird populations are important components of the food chain for larger animals. Many raptors have been observed feeding along ditch banks and in seepage areas. In addition, small birds and mammals are important not only as raptor and mammalian carnivore food, but also for the color, diversity and interest they add to rural and urban life styles.

Some irrigation induced wetlands may prove to be important native plant habitats. Frequently disturbed areas, such as ditch banks and open drains, are usually vegetated by early successional plant species. Seepage induced wetlands along the major canals, often undisturbed for nearly 100 years, have more diversified, stable plant populations. Due to their age and stability, they may prove important as reservoirs of native wetland vegetation and as "relict" areas for vegetation studies.

There are an estimated 39,600 acres of wetland within the irrigated area of the Lower Gunnison Basin Unit including 37,400 acres interspersed throughout the irrigated portion of the study area. Table IV-6 shows probable water sources supplying these wetlands. Soils with gley characteristics (both red and grey which develop in permanently wet soils) make up about 6,000 acres of the natural wetlands. These soils with gley characteristics are not expected to be affected by the salinity control program. Irrigation management (method of irrigation and level of management) contributes a significant portion of the water supply to about 14,800 acres (37.4 percent) of the wetlands. Table IV-7 identifies those wetlands influenced by irrigation, either separately or in combination with other water sources.

TABLE IV-6
WETLANDS AS CLASSIFIED BY WATER SOURCES, ^{1/}
LOWER GUNNISON SALINITY CONTROL STUDY

Water Sources	Percent of Total Wetlands	Acres
Natural	60.1%	23,810
Irrigation Management (onfarm)	15.3	6,050
Canal	1.7	620
Natural & Irrigation Management (onfarm)	19.2	7,610
Natural & Canal	0.8	320
Natural & Irrigation Management (onfarm) & Canal	0.1	40
Irrigation Management (onfarm) & Canal	2.8	1,100
Total	100.0%	39,600

^{1/} After Lower Gunnison River Basin Wetland Inventory and Evaluation, Rector, Mustard and Windell, 1978. p. 16. (Numeric values extrapolated to be representative of the larger irrigated area studied by SCS.)

TABLE IV-7
WETLANDS INFLUENCED BY IRRIGATION WATER MANAGEMENT (ONFARM)
LOWER GUNNISON SALINITY CONTROL STUDY 1/

Water Sources	Percent of Total Wetlands	Acres
Irrigation Management (onfarm)	15.3%	6,050
Natural & Irrigation Management (onfarm)	19.2	7,610
Natural & Irrigation Management (onfarm) & Canal	0.1	40
Irrigation Mangement (onfarm) & Canal	2.8	1,100
Total	37.4%	14,800

1/ After Lower Gunnison River Basin Wetland Inventory and Evaluation, Rector, Mustard and Windell, 1978. p. 16. (Numeric values extrapolated to be representative of the larger irrigated area studied by SCS.)

Table IV-8 shows acreages of wetland types 1 and 2 (as described in U.S. Fish and Wildlife Service Circular 39, Wetlands of the United States), which constitute 7,200 acres (48.7 percent) of the 14,800 acres of wetland attributed to irrigation.

TABLE IV-8 - ONFARM IRRIGATION WATER MANAGEMENT
INFLUENCED WETLANDS BY WETLAND TYPES
LOWER GUNNISON SALINITY CONTROL STUDY

Wetland Type*	Percent of Total Wetlands	Acres
1	9.5	1,408
2	39.2	5,812
Other**	51.3	7,606
Total	100.0%	14,826

*After Circular 39, U.S. Fish & Wildlife Service Classification.

**Includes Wetland Types 3, 4, 5, 6, 9, 10, 11.

The U.S. Fish and Wildlife Service furnished the following list of threatened and endangered plants and animals that may occur in the project area:

Listed Species

Bald eagle	<u>Haliaeetus leucocephalus</u>
American peregrine falcon	<u>Falco peregrinus anatum</u>
Whooping crane	<u>Grus Americana</u>
Black-footed ferret	<u>Mustela nigripes</u>
Colorado squawfish	<u>Ptychocheilus lucius</u>
Humpback chub	<u>Gila cypha</u>
Uintah Basin hookless cactus	<u>Sclerocactus glaucus</u>
Mesa Verde cactus	<u>Sclerocactus mesae-verdae</u>
Hedgehog cactus	<u>Echinocereus triglochidiatus</u>

Proposed Species

None

A two-year study, Lower Gunnison River Basin Wetland Inventory & Evaluation, by Rector, Mustard and Windell, 1978, revealed the observation of one bald eagle and no threatened or endangered plants. A biological assessment was completed and submitted to USFWS in accordance with Section 7(c) of Public Law 95-632.

None of the listed species appear to be affected by the proposed action.

D. Environmental Consequences

Introduction

Environmental impacts for each of the alternate plans are displayed in Table A1-4. Primary impacts will occur on those wetlands that have developed since irrigation was first introduced in the valley.

Wetland Impacts

Wetlands impacted by the Salinity Control Program primarily have developed as a result of introducing irrigated agriculture into the area about 100 years ago. These wetlands may be fed by water seeping from canals, laterals and ditches, fed by water accumulating in natural depressions, fed by subsurface or ground water being forced to the surface by geological conditions, or fed by runoff water following natural or manmade drainage ways back to the river. As irrigation systems and practices are made more efficient the supply of water feeding these areas will diminish. With diminishing water supply vegetation changes naturally will occur. The Salinity Control Program does not propose to drain wetlands for the purpose of converting them to agricultural or other uses.

Because impacts will result from improving the efficiency of existing irrigation systems and practices it is reasoned that the degree of impact for each alternative plan will be inversely proportional to the change in irrigation efficiency. If efficiency remains unchanged, no loss of wetlands is expected; a 10 percent increase in efficiency causes a 10 percent loss in the irrigation induced wetlands. Impacts will be confined to the respective areas improved by the alternative plans and will be commensurate with the type of improvement made. Localized areas obviously dependent on ditch seepage will be dried up by ditch lining. Larger areas fed by surface, subsurface, or ground water return flows are not expected to vanish completely, however, they may be reduced in size or degree of wetness because less water will be available as return flow. Similar wetlands and riparian wetlands elsewhere in the valley will be unchanged. Secondary impacts will be noticed along earth ditch banks as they are replaced by pipelines, gated pipe or impervious lining.

The Environmental Subteam of the Interagency Multiple-Objective Planning Team indicated the significant adverse environmental impact resulting from implementation of conservation measures to control salinity would occur on wetland habitat. It is also recognized that salinity control, i.e., water quality improvement, will be a beneficial environmental impact of the salinity control effort.

Table IV-9 indicates the calculated loss of wetlands and the estimated salt reduction, by alternative.

Table IV-9 - ANTICIPATED WETLAND HABITAT LOSSES AND SALT REDUCTION BY ALTERNATIVE, LOWER GUNNISON SALINITY CONTROL STUDY

Alternative	Wetland Losses (ac)	Salt Reduction (1000 tons)	Acres of Wetland Lost/ 1000 tons Salt Reduction
1	370	10	37
2	750	35	21
3	1,300	140	9
4	400	205	2
5	3,100	235	13
6	5,900	340	17
7	3,800	320	12
8	13,200	420	31

Historical and Archeological Impacts

Impacts on historical and archeological values will be minimal because program activities primarily will be confined to areas previously disturbed by cultivation. However, it is recognized that construction activity in previously undisturbed soils could possibly uncover new sites of archeological value. When implementation is undertaken and if any new sites are found during the construction phase of the program the landowner and the State Historic Preservation Officer will be notified. The landowner will be asked to suspend operations for 48 hours to give the staff of the State Historic Preservation Office and that of Interagency Archeologic Services (USDI) time to evaluate the significance of the site. The State Historic Preservation Officer and USDI will be asked to determine eligibility of the site for the National Register of Historic Places within 48 hours. If the site is eligible SCS will follow its procedures in 7 CFR 656, July 18, 1977, as amended June 23, 1978. The probability for discovering new sites is directly proportional to the size of the area targeted for assistance under each of the alternative plans.

Salt Load Reduction

The potential for salt load reduction, directly proportional to the cost of installing improvements for salinity control, ranges from 10,000 tons annually under continuation of ongoing programs to 420,000 tons annually under Alternative 8, the most sophisticated, extensive and costly of the alternative plans. The potential for salt load reduction for each of the alternative plans is shown in Table A1-4.

Ground Water

Ground water quality is not expected to change significantly as a result of the salinity control program. Shallow ground water located in and above weathered zones of the upper mancos shale formation has high salinity

concentration because of the salts embedded in the shale. Any ground water located below the Mancos shale will not be affected because of the relatively impervious nature of the deeper unweathered shale. The volume of shallow ground water flowing above and through the weathered shale will be reduced as irrigation systems and practices become more efficient.

Energy Requirements

Energy requirements (U.S. Department of Energy, 1979) in trillions of BTU's for constructing all features of each alternative plan are:

TABLE IV-10 ENERGY REQUIREMENTS

Plan Number	1	2	3	4	5	6	7	8
Onfarm Program	0.145	0.375	1.575	2.722	3.545	6.507	7.303	15.234
Off-farm Program	-	-	0.869	1.386	1.096	1.128	0.639	1.228
Totals	0.145	0.375	2.444	4.108	4.641	7.635	7.942	16.462

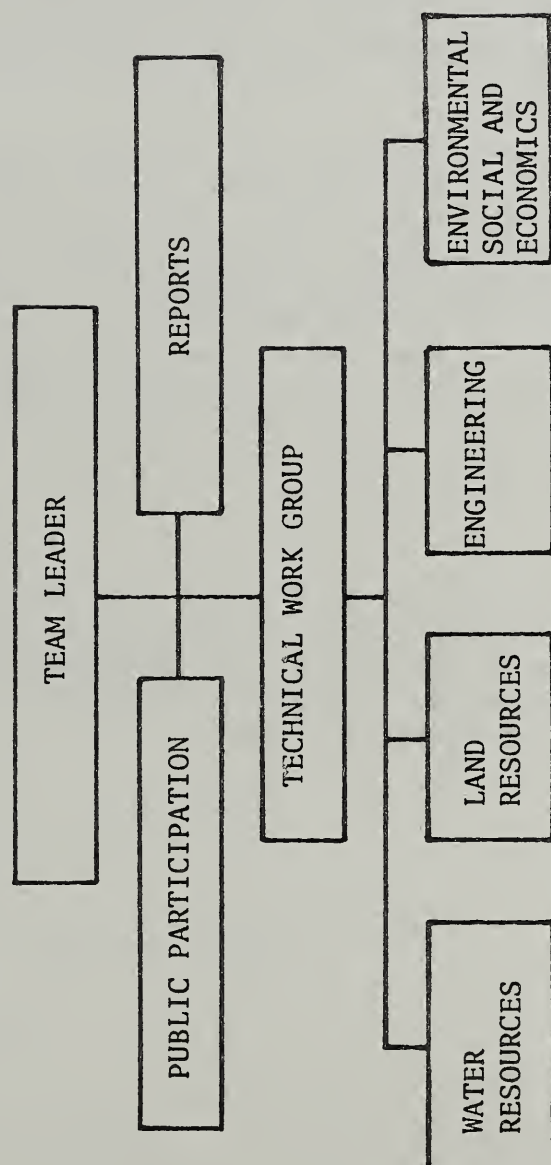
We do not have available data to show operation and maintenance energy requirements, to display overall net energy effect.

E. Public Participation

Public participation in the Lower Gunnison Salinity Control Study began when the Bureau of Reclamation issued an invitation for interested agencies, groups and individuals to participate in formulating an interagency, interdisciplinary, Multi-Objective Planning (MOP) Team. The organizational meeting was held in Montrose, Colorado, on May 4, 1977. The structure of the MOP team and its subunits is shown in Figure IV-3. Soil Conservation Service personnel have actively and continuously participated as members of the MOP team and in some of its subunits. The subunits conduct evaluations and analyses related to each discipline and then meet together as a full MOP team to present results, to resolve interdisciplinary problems and to set the direction for the overall study.

The Bureau of Reclamation limited its study to the Uncompahgre Project, an area roughly bounded by the Gunnison River on the north and the east, and including the irrigated farmland west of the Uncompahgre River. The area studied by the salinity control study includes the private farmland within the Uncompahgre Project area plus private farmland and off-farm laterals in the area north and east of the Gunnison River.

FIGURE IV-3 MULTI-OBJECTIVE PLANNING TEAM
LOWER GUNNISON SALINITY CONTROL STUDY, COLORADO



concentration because of the salts embedded in the shale. Any ground water located below the Mancos shale will not be affected because of the relatively impervious nature of the deeper unweathered shale. The volume of shallow ground water flowing above and through the weathered shale will be reduced as irrigation systems and practices become more efficient.

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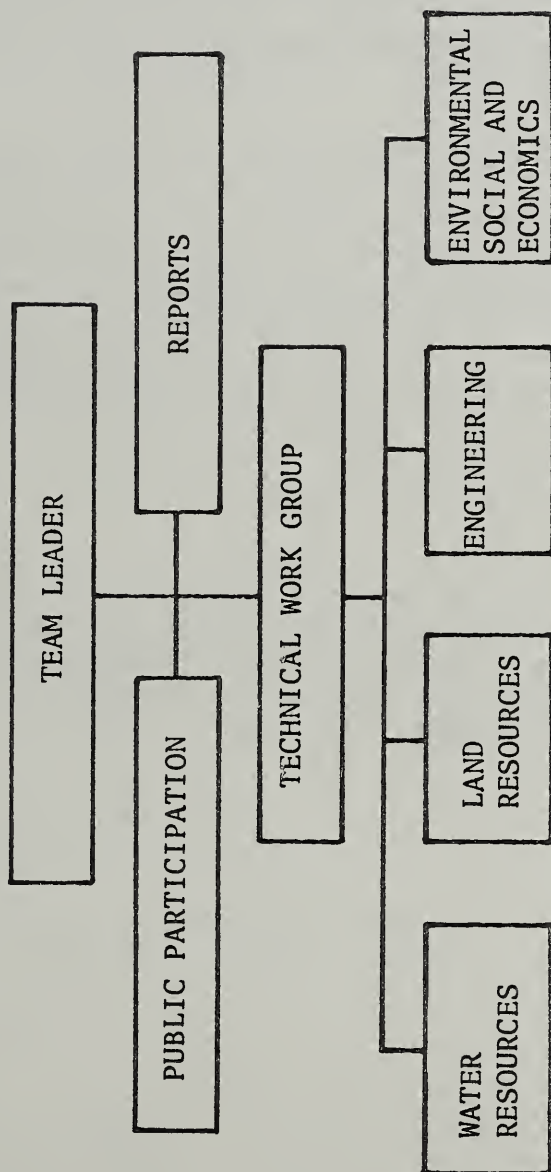
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FIGURE IV-3 MULTI-OBJECTIVE PLANNING TEAM
LOWER GUNNISON SALINITY CONTROL STUDY, COLORADO



Early results of onfarm evaluations by SCS showed the effect of three levels of improvement. These levels of improvement were presented at a joint meeting of the Gunnison, Delta and Shavano Soil Conservation Districts (SCDs) in September 1978, held at Montrose, Colorado. The consensus from that meeting was that the highest level of improvement should be evaluated in more detail. Further evaluation suggested that the size of the area targeted for improvement could be based on three levels of cost effectiveness, the smallest area being the most cost effective. These results were presented to a joint meeting of the Agricultural Stabilization and Conservation Service (ASCS) County Committee and the Board of Directors of the Soil Conservation Districts serving Delta and Montrose Counties at a meeting held in January 1980, and a followup meeting held in March 1980. Both meetings were held at Montrose, Colorado, to solicit opinion on the size of area to be treated. The consensus of the meeting was that all areas should receive some treatment, but that a uniform degree of treatment for all areas may not be necessary.

On April 30, 1980, the SCS joined with the USBR to hold a Public Scoping Meeting at Olathe, Colorado, where the results of the evaluations were presented and local opinion on environmental concerns was solicited. No significant local environmental issues were raised at the meeting. In fact, the local people thought the agencies were overly concerned with environmental issues not considered important by the local people. Plan five was considered the least acceptable by the people in attendance at the scoping meeting because it limits treatment to only the poorer agricultural soils in the valley. Plan eight was considered to be most acceptable and plan seven was the second most desirable.

Alternate 6 although not chosen as being among the most desirable, does maximize net benefits to the farmer.

After reexamining the concept of a uniform level of improvement throughout all 26 watersheds the eight alternative plans included in this supplement were presented in separate public meetings to the ASCS County Committee and to the Board of Directors for the Soil Conservation Districts serving Delta and Montrose Counties. Both meetings were held on November 12, 1980.

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G. Appendices

(A) Four Account Tables Displayed in Principles and Standards Format

(B) Federal Permits

(A) Summary of Alternative Plans Displayed in Principles and Standards Format

The Principles and Standards accounts illustrating the National Economic Development, Environmental Quality, Regional Development, and Other Social Effects for each Alternative Plan are shown in Tables A1-1, A1-2, A1-3 and A1-4.

NED Account

This account consists of the direct beneficial, adverse and net effects from program implementation. Benefits consist of onfarm and downstream benefits.

The onfarm benefits were developed for the continuation of ongoing programs for each of the alternative plan. Production costs were identified with particular emphasis being placed on variable costs. In cases where it was determined that yield levels and/or production costs varied by soil classes, crop budgets were developed accordingly.

Items of benefit measured on the crop budgets include irrigation labor cost savings, operation and maintenance cost savings, energy and fuel cost savings, machinery labor cost savings, fertilizer cost savings, and increased crop yields. Data were then analyzed on a watershed basis according to the number of acres by class of soil.

The downstream benefits consist of the salt reduction in tons attainable for each alternative multiplied by \$52 per ton.

The adverse effects are the installation costs. These total costs are shown in the summary of each alternative plan. However, both costs and benefits are developed on an average annual basis for the NED account. They are computed in Present Value terms so both are displayed on the same time frame basis.

RD Account

The annual benefits and cost developed for the NED Account are also used in the RD Account; however, benefits and costs are broken out according to the benefits and costs accruing to the area.

In addition, other benefits used in the RD Account that accrue because of project actions are employment benefits and externalities. Employment benefits accrue because of employment of otherwise unemployed or underemployed labor resources during project implementation.

Externalities include two types of benefits: the first type "stems from" implementation and the second type is "induced by" implementation. Benefits that stem from implementation arise from the increased production of goods. With this increased supply of goods, new demands are placed upon the transporting, processing and marketing industries of the local area. Benefits induced by implementation arise from increased expenditures by local people in the area. These benefits result from the supplying of additional materials and services required to make possible the increased net returns which stem from installation of the irrigation improvements.

Other Social Effects

This account emphasizes and compares by alternative the beneficial and adverse effects of the distribution of real income and other social opportunities. The table shows income class distribution along with the distribution of benefits and expenses anticipated to occur in the study area. A descriptive qualitative interpretation of life, health and safety is also stated.

Environmental Quality Account

This table compares each alternative as to the acres treated and the anticipated effects that will occur. Beneficial and adverse effects that change the quality of life are stated. A quantitative to qualitative analysis was made on the environmental factors identified as having an impact. Impact changes that surfaced include water quantity, water quality and wetlands. Also, it was found that there are no sites on the National Register of Historic Places which will be altered. However, if during construction anything of historical or archeological value or any endangered plants, fish or wildlife may be affected, work will be stopped until the problem is alleviated.

Table A1-1
National Economic Development Account 1/
Lower Gunnison Salinity Controls Study, Colorado
(Includes Cost of Off-Farm Laterals with the Onfarm Program)
(\$1,000,000 increments)

		Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8
A. Beneficial Effects									
1. Value of Goods and Services									
a. Onfarm Benefits	(\$)	-	0.17	0.00	-0.19	2.00	4.06	3.78	8.68
b. Downstream Benefits	(\$)	0.52	1.85	4.90	7.75	9.95	15.41	15.55	19.29
c. Off-farm Downstream Ben.	(\$)	-	-	2.34	2.86	2.34	2.34	1.82	2.60
d. Benefits during installation period	(\$)	0.25	0.98	3.53	5.09	6.98	10.66	10.34	14.94
Total Beneficial Effects	(\$)	0.77	3.00	10.77	15.51	21.27	32.47	31.49	45.51
B. Adverse Effects									
1. Implementation Costs									
a. Project Installation	(\$)	0.21	0.57	3.76	6.31	7.21	11.72	12.24	25.35
b. Project Administration	(\$)	0.02	0.06	0.38	0.63	0.73	1.18	1.24	2.56
c. Operation & Maintenance	(\$)	0.02	0.02	0.34	0.60	0.54	0.91	.80	1.88
d. Costs during installation period 2/	(\$)	0.11	0.27	1.84	3.11	3.50	5.70	5.98	12.25
Subtotal Implementation Costs	(\$)	0.36	0.92	6.32	10.65	11.98	19.51	20.26	42.04
2. Mitigation Costs	(\$)								
a. Full value replacement. Enhance avoided areas (valley-wide) plus add new acres if needed.		0	0.43	0.76	0.23	1.82	3.42	2.20	5.50
C. Net Beneficial Effects Without Mitigation	(\$)	0.41	2.08	4.45	4.86	9.29	12.96	11.23	3.47
D. Net Beneficial Effects With Mitigation	(\$)	0.41	1.65	3.69	4.63	7.47	9.54	9.03	-2.03

1/ Costs were amortized at 7 3/8% for 25 years. July 1980 price base. Benefits and costs were computed in present value terms using 10-year installation period.

2/ Includes interest on O&M and construction costs and O&M cost during installation period.

Table A1-1 (Cont'd)

National Economic Development Account 1/
Lower Gunnison Salinity Control Study, Colorado
(Includes Cost of Onfarm Program Only)
(\$1,000,000 increments)

		Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8
A. Beneficial Effects									
1. Value of Goods and Services									
a. Onfarm Benefits	(\$)	0	0.17	0	-0.19	2.00	4.06	3.78	8.68
b. Downstream Benefits	(\$)	0.52	1.85	4.90	7.75	9.95	15.41	15.55	19.29
c. Benefits during installation period	(\$)	0.25	0.98	2.39	3.69	5.84	9.52	9.45	13.67
Total Beneficial Effects	(\$)	0.77	3.00	7.29	11.25	17.79	28.99	28.78	41.64
B. Adverse Effects									
1. Implementation Costs									
a. Project Installation	(\$)	0.21	0.57	2.42	4.18	5.53	9.99	11.26	23.46
b. Project Administration	(\$)	0.02	0.06	0.24	0.42	0.56	1.01	1.14	2.37
c. Operation & Maintenance	(\$)	0.02	0.02	0.02	0.38	0.37	0.73	.75	1.68
d. Costs during installation period 2/	(\$)	0.11	0.27	1.18	2.05	2.65	4.83	5.40	11.32
Subtotal Implementation Costs	(\$)	0.36	0.92	4.04	7.03	9.11	16.56	18.55	38.83
2. Mitigation Costs	(\$)								
a. Full value replacement. Enhance avoided areas (valley-wide) plus add new acres if needed.		0	0.43	0.76	0.23	1.82	3.42	2.20	5.50
C. Net Beneficial Effects Without Mitigation	(\$)	0.41	2.08	3.25	4.22	8.68	12.43	10.23	2.81
D. Net Beneficial Effects With Mitigation	(\$)	0.41	1.66	2.49	3.99	6.85	9.01	8.03	-2.69

1/ Costs were amortized at 7 3/8% for 25 years. July 1980 price base. Benefits and costs were computed in present value terms using 10-year installation period.

2/ Includes interest on O&M and construction costs and O&M costs during installation period.

Regional Development Account 1/
Lower Gunnison Salinity Control Study, Colorado
(\$1,000,000 increments)

	Plan 1		Plan 2		Plan 3		Plan 4	
	State of Colorado	Rest of Nation	State of Colorado	Rest of Nation	State of Colorado	Rest of Nation	State of Colorado	Rest of Nation
I. Income								
A. Beneficial Effects								
1. Value of Goods and Services								
a. Onfarm Benefits (\$)	-	-	0.17	-	0	-	-0.19	-
b. Downstream Benefits (\$)	-	0.52	-	1.85	-	4.90	-	7.75
c. Construction Labor (\$)	0.02	-	0.05	-	0.33	-	0.56	2.86
d. Downstream Benefits (\$)	-	-	-	-	-	2.34	-0.09	5.18
(off-farm laterals)								
e. Benefits during installation period (\$)	-	0.25	0.08	0.90	-	3.53	-	-
2. Value of External Economies								
a. Benefits during installation period	-	-	0.30	-	-	-	-0.33	-
b. Benefits during installation period	0.02	0.77	0.60	2.75	0.33	10.77	-0.05	15.79
Total Beneficial Effects								
B. Adverse Effects								
1. Implementation Costs								
a. Project Installation 4/ (\$)	0.05	0.16	0.14	0.43	0.94	2.82	1.58	4.73
b. Project Administration (\$)	-	0.02	-	0.06	-	0.38	-	0.63
c. Operation & Maintenance (\$)	0.02	-	0.02	-	0.34	-	0.60	-
d. Costs during installation period 5/ (\$)	0.05	0.06	0.07	0.20	0.54	1.30	0.93	2.18
2. Mitigation								
a. Mitigation (\$)	-	-	-	0.43	-	0.76	-	0.23
Total Adverse Effects (\$)	0.12	0.24	0.23	1.12	1.82	5.26	3.11	7.77
Net Beneficial Effects (\$)	-0.10	0.53	0.37	1.63	-1.49	5.51	-3.16	8.02
II. Employment								
A. Beneficial Effects								
1. Increase in Jobs								
a. Semi-skilled 2/	1.1	-	3.4	-	20.9	-	35.2	-
b. Unskilled 2/	11.8	-	36.7	-	225.3	-	379.6	-
c. Agriculture 3/	-	-	65.2	-	-	-	58.3	-
2. Decrease in Jobs								
a. Agricultural 3/	-	-	-	-	-	-	-	-

1/ Costs were amortized at 7 3/8% for 25 years. July 1980 price base. Costs and benefits were computed in present value terms using 10-year installation period.

2/ Work years.

3/ Work years/year.

4/ Based on 75 percent federal cost share.

5/ Includes interest on O&M and construction costs and O&M costs during installation period.

Table A1-2
Regional Development Account 1/
Lower Gunnison Salinity Control Study, Colorado
(\$1,000,000 increments)

	Plan 5		Plan 6		Plan 7		Plan 8	
	State of Colorado	Rest of Nation	State of Colorado	Rest of Nation	State of Colorado	Rest of Nation	State of Colorado	Rest of Nation
I. Income								
A. Beneficial Effects								
1. Value of Goods and Services								
a. Onfarm Benefits (\$)	2.00	-	4.06	-	3.78	-	8.68	-
b. Downstream Benefits (\$)	-	9.95	-	15.41	-	15.55	-	19.29
c. Construction Labor (\$)	0.65	-	1.08	-	1.14	-	2.36	-
d. Downstream Benefits (\$)	-	2.34	-	2.34	-	1.82	-	2.60
(off-farm laterals)								
e. Benefits during installation period (\$)	0.98	6.00	2.00	8.66	1.85	8.49	4.24	10.70
2. Value of External Economies								
Total Beneficial Effects	3.51	-	7.12	-	6.63	-	15.22	-
B. Adverse Effects								
1. Implementation Costs								
a. Project Installation 4/ (\$)	1.80	5.41	2.93	8.79	3.06	9.18	6.34	19.01
b. Project Administration (\$)	-	0.73	-	1.18	-	1.24	-	2.56
c. Operation & Maintenance (\$)	0.54	-	0.91	-	.80	-	1.88	-
d. Costs during installation period 5/ (\$)	0.99	2.51	1.63	4.07	1.63	4.35	3.50	8.75
2. Mitigation								
Total Adverse Effects (\$)	-	1.82	-	3.42	-	2.20	-	5.50
Net Beneficial Effects (\$)	3.33	10.47	5.47	17.46	5.49	16.97	11.72	35.82
	3.81	7.82	8.79	8.95	7.91	8.89	18.78	-3.23
II. Employment								
A. Beneficial Effects								
1. Increase in Jobs								
a. Semi-skilled 2/	41.2	-	67.5	-	7.13	-	147.9	-
b. Unskilled 2/	442.2	-	729.3	-	770.1	-	1597.1	-
c. Agriculture 3/	-	-	-	-	-	-	-	-
2. Decrease in Jobs								
a. Agricultural 3/	106.0	-	137.0	-	70.3	-	438.6	-

1/ Costs were amortized at 7 3/8% for 25 years. July 1980 price base. Costs and benefits were computed in present value terms using 10-year installation period.

2/ Work years.

3/ Work years/year.

4/ Based on 75 percent federal cost share.

5/ Includes interest on O&M and construction costs and O&M costs during installation period.

Table A1-3
Other Social Effects Account 1/
Lower Gunnison Salinity Control Study, Colorado

	Plan 1	Plan 2	Plan 3	Plan 4	Plan 5	Plan 6	Plan 7	Plan 8
A. Real Income Distribution								
1. Regional Farm Income 2/	(\$)	0.00	0.25	0.00	-0.28	2.98	5.63	12.92
2. Regional Farm Expense 2/	(\$)	0.12	0.23	1.82	3.11	3.33	5.49	11.72
3. Distribution by Class								
a. Adj. Gross Farm Income								
Under \$2,500	(%)	30	30	30	30	30	30	30
\$2,500 - \$10,000	(%)	25	25	25	25	25	25	25
\$10,000-\$20,000	(%)	15	15	15	15	15	15	15
Over \$20,000	(%)	30	30	30	30	30	30	30
b. Benefits								
Under \$2,500	(%)	30	30	30	30	30	30	30
\$2,500 - \$10,000	(%)	25	25	25	25	25	25	25
\$10,000-\$20,000	(%)	15	15	15	15	15	15	15
Over \$20,000	(%)	30	30	30	30	30	30	30
c. Expense								
Under \$2,500	(%)	30	30	30	30	30	30	30
\$2,500 - \$10,000	(%)	25	25	25	25	25	25	25
\$10,000-\$20,000	(%)	15	15	15	15	15	15	15
Over \$20,000	(%)	30	30	30	30	30	30	30
B. Life, Health and Safety	yes/no							
1. Reduce salt content in water used by more than 17 1/2 million downstream residents in Colorado, Utah, California, Arizona, Nevada and the Republic of Mexico.	yes	yes	yes	yes	yes	yes	yes	yes
2. Increase the assessed valuation of property and tax revenues from farms and farm related businesses due to the project.	no	yes	no	no	yes	yes	yes	yes

1/ Costs were amortized at 7 3/8% for 25 years. July 1980 price base. Benefits and costs were computed in present value terms with a 10-year installation period.

2/ Increments of \$1,000,000

Table A1-3 (Cont'd)

	<u>Plan 1</u>	<u>Plan 2</u>	<u>Plan 3</u>	<u>Plan 4</u>	<u>Plan 5</u>	<u>Plan 6</u>	<u>Plan 7</u>	<u>Plan 8</u>
3. Increased output and long term stabilizing influence on agricultural population and out-migration	no	no	no	no	no	yes	yes	yes
4. Installation of irrigation measures will result in significantly higher crop yields, and more efficient use of irrigation water and lower fertilizer needs.	no	no	no	no	yes	yes	yes	yes
5. Installation will result in lower labor costs	no	no	no	no	yes	yes	yes	yes
6. Energy consumption in trillions of BTU's								
a. Onfarm Program	0.145	0.375	1.575	2.722	3.545	6.507	7.303	15.234
b. Off-farm Laterals	-	-	0.869	1.386	1.096	1.128	0.639	1.228
c. Totals	0.145	0.375	2.444	4.108	4.641	7.635	7.942	16.462

Environmental Quality Account
Lower Gunnison Salinity Control Study, Colorado

Alternative Plan Number

	1	2	3	4	5	6	7	8
A. Irrigated Area Treated (ac)	169,000	55,900	35,800	43,800	41,400	117,100	169,000	169,000
B. Water Quantity (ac.ft./yr)								
1. Diversion 1/	1,300,000	1,310,000	1,280,000	1,365,000	1,165,000	1,305,000	1,300,000	770,000
2. Change in Diversion		-10,000	20,000	-65,000	135,000	-5,000	0	530,000
3. Delivered to Farms	828,000	836,000	816,000	870,000	744,000	830,000	820,000	486,000
4. Onfarm Deep Percolation	50,000	49,000	50,000	54,000	49,000	47,000	52,000	38,000
5. Consumptive Use (Onfarm) 2/	246,000	257,000	243,000	266,000	267,000	283,000	273,000	313,000
6. Consumptive Use (Wetland) 2/	79,000	78,000	77,000	79,000	73,000	67,000	72,000	52,000
7. Reduction in Consumptive Use	4,000	-8,000	6,000	-17,000	-10,000	-24,000	-15,000	-37,000
8. Return Flow	975,000	975,000	960,000	1,020,000	825,000	955,000	955,000	405,000
9. Onfarm Irrig. Efficiency (%)								
a. Valleywide Effect	30	31	30	31	36	35	33	65
b. Improved Areas Only	30	37	31	38	61	52	33	65
C. Water Quality								
1. Reduction in Salt Loading (tons) 3/	10,000	35,000	95,000	150,000	190,000	290,000	335,000	365,000
2. Reduction in Salt Concentrations at Imperial Dam (mg/l)	1.5	2.5	10.9	12.8	20.2	27.4	34.9	40.7
3. Salt Concentrations Upstream from Parker Dam	826.3	825.5	818.6	817.0	810.8	804.9	798.7	793.9
D. Wetlands								
1. Area of Wetlands in treatment area (ac)	37,400	12,200	7,800	9,600	9,100	25,600	37,400	37,400
2. Habitat Value (HVU) 4/	1,310,000	428,300	274,300	335,500	317,500	897,500	1,310,000	1,310,000
3. Impacts								
a. Area (ac)	370	750	1,300	400	3,100	5,900	3,800	13,200
b. Values (HVU)	13,000	25,700	45,500	13,400	109,200	205,500	132,300	461,200
4. Avoided Impacts (valley-wide)								
a. Area (ac)	37,030	36,650	36,100	37,000	34,300	31,500	33,600	24,200
b. Values (HVU)	1,296,000	1,283,000	1,264,000	1,295,000	1,200,000	1,103,000	1,176,000	847,000
E. Wetland Mitigation Options								
1. Full Value Replacement								
a. Area Improved (ac)	840	1,700	3,000	900	7,300	13,700	8,900	18,300
b. Habitat value of improvement (HVU)	13,000	25,700	45,500	13,400	104,200	205,500	132,300	274,400
c. Additional area needed (ac)	0	0	0	0	0	0	0	3,700
d. Habitat values lost (HVU)	0	0	0	0	0	0	0	186,800
2. No Mitigation								
a. Habitat values lost (HVU)	13,000	25,700	45,500	13,400	109,200	205,500	132,300	461,200
b. Percent of Total	1.0	2.0	3.5	1.0	8.3	15.8	10.2	35.3
F. Historical and Archeological								
1. Sites listed in National Register 4/ 5/	0	0	0	0	0	0	0	0
2. Area avoided (ac) 5/ 6/	0	115,000	135,100	127,100	129,500	53,800	0	0

1/ Based on volume of water diverted to irrigate the 169,000 acres in the valley.

2/ Present consumptive use on 171,000 acres of irrigated cropland is 248,000 acre-feet per year, and on 37,400 acres of wetlands is 80,000 acre-feet per year.

3/ Based on 169,000 acres of improved irrigated land remaining after program implementation.

4/ HVU = Habitat Value Units after Golet's system of analysis.

5/ Should sites of archeological value be discovered during construction, work will be stopped to give the State Historic Preservation Officer time to assess the value of the site and salvage valuable artifacts.

6/ Area Avoided = Total Irrigated Area - Irrigated Area Treated.

7/ Values adjusted March 1982.

(B) Permits

There are no known Federal permits, licenses or other entitlements required prior to implementing the proposed works of improvement.

The scope of work proposed in the alternative plans presented herein is limited to implementing soil and water conservation practices needed for improving onfarm use and management of irrigation water and to improving off-farm distribution canals and laterals for that water. The only work to be undertaken in natural streams and water courses will be limited to replacing existing diversion structures located in the small high mountain tributaries of the Gunnison River in Delta County, Colorado.

V UINTAH BASIN UNIT SECTION

A. Introduction

This portion of the supplement to the Colorado River Water Quality Improvement Program Final Environmental Statement covers the cumulative effects of implementing the onfarm irrigation water management and land treatment practices for the Uintah Basin Unit in Utah (see Figure 1, Location Map). Environmental evaluation of each specific conservation practice will be made as it is planned and implemented. Implementation of onfarm measures has been accelerated recently by additional cost-share funds made available through the Agriculture Conservation Program (ACP) administered by the Agricultural Stabilization and Conservation Service (ASCS). The Soil Conservation Service (SCS) has increased staff and facilities in the Uintah Basin to provide the needed additional technical assistance.

B. Alternatives Including Recommended Plan

Introduction

Four alternatives were vigorously pursued in the planning process. These were the alternatives of continuation of ongoing programs, farmer identified irrigation improvements, the maximum potential level of development, and a recommended alternative (Figure V-2) which incorporated portions of the other three. An alternative of land retirement from irrigation was also investigated briefly.

The alternative plans are based on implementation of onfarm improvements and farm management practices which will increase irrigation efficiencies and reduce salinity. Irrigation efficiency can be improved by: (1) installing and using water conveyance and control structures and measuring devices; (2) using the irrigation system best adapted to the soil, crops, and level of management desired; (3) utilizing soils information to properly design and lay out irrigation systems; and (4) applying the proper amount of water at the proper time to meeting crop consumptive use.

As alternative plans were developed, it was determined that five general types of irrigation systems give the desired results and satisfy the above conditions. These include two types of improved surface systems and three types of sprinkler systems. Each alternative is based on different combinations and varying amounts of the five types of systems. Irrigation water management is included as an integral part of each alternative. The irrigation systems include buried mainline and laterals, surface laterals with sprinklers, pumping plants where applicable, water measuring devices, and all appurtenant structures. Installation of irrigation water measuring devices will provide the necessary data to monitor effectiveness of the conservation practices and management techniques.

The improved surface systems include land leveling and reorganization of the irrigation system. Reorganizing irrigation systems includes installing ditch lining or pipeline, all appurtenant structures, including measuring devices and gated pipe or siphon tubes compatible with the proposed irrigation method.

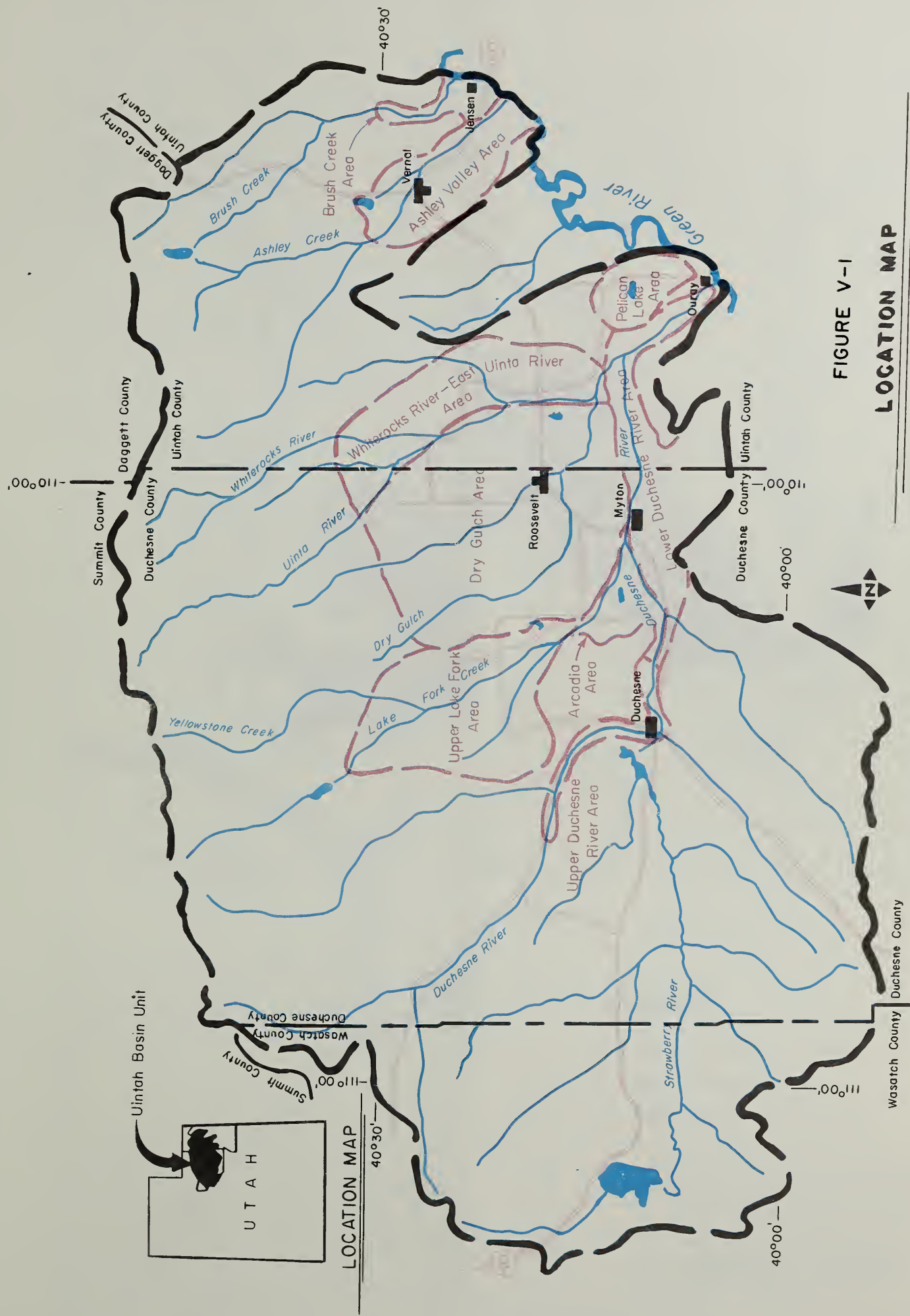
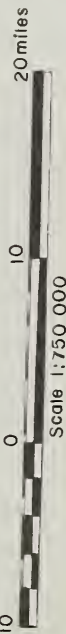


FIGURE V-1

LOCATION MAP

UINTAH BASIN UNIT
Duchesne, Uintah and Wasatch Counties, Utah



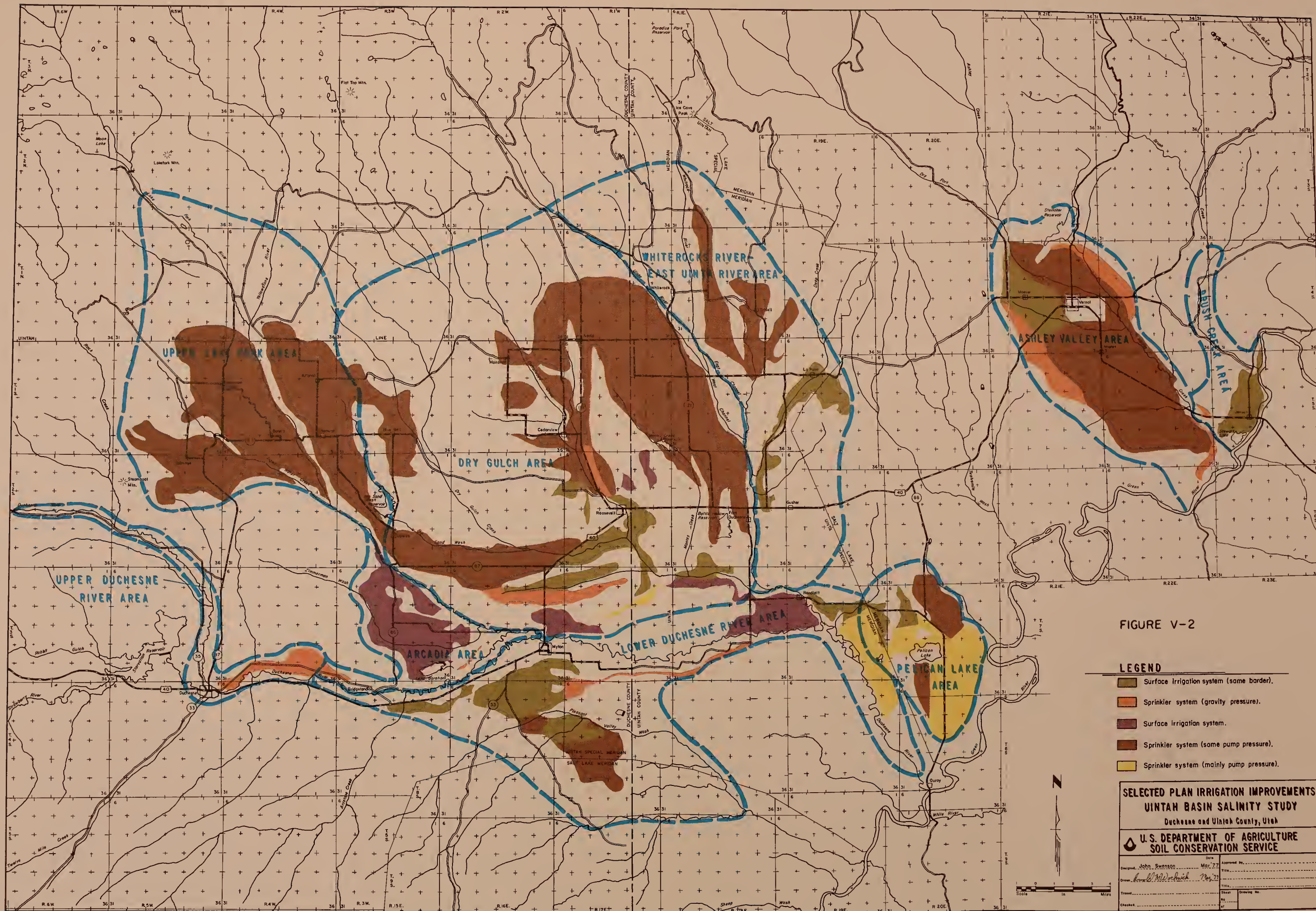


FIGURE V-2

LEGEND

- Surface irrigation system (same border).
- Sprinkler system (gravity pressure).
- Surface irrigation system.
- Sprinkler system (some pump pressure).
- Sprinkler system (mainly pump pressure).

**SELECTED PLAN IRRIGATION IMPROVEMENTS
UINTAH BASIN SALINITY STUDY**

Duchesne and Uintah County, Utah

**U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

Designed: John Swenson Drawn: Harold McWhinney Title: _____ Date: Mar. 77 Sheet: _____ Drawing No.: _____	Approved by: _____ Title: _____ Date: _____ Sheet: _____ Drawing No.: _____
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Selected plantings for food and cover for wildlife, fencing to exclude grazing, and other mitigation features such as nesting platforms, are being incorporated into long term agreements with farmers to provide more food and cover for wildlife.

The alternative plans do not include any changes in the off-farm major canal systems or any effect the conveyance systems have on the salinity in the Colorado River. Canals and major laterals are being studied separately by USBR.

The alternative plans do not include any changes in water storage facilities. A more timely water supply would enhance crop yields but is outside the scope of this evaluation.

Drainage of the irrigated lands is not included as an aspect of any alternative. Saline water from the drains flows directly into streams and eventually into the Colorado River. This gives the appearance that the construction of drains should be discouraged. There are, however, some areas where gravelly soils overlie saline shales. Drains in these soils can remove some of the percolating irrigation water before it makes contact with the shales. Also, since these areas are gravelly, drainage may not be necessary for agricultural purposes and may, therefore, not be installed.

Since drainage water is a direct contributor of salt to the surface waters, drainage is generally not compatible with the objective of salinity control. Also, drainage systems would dry up wetland habitat. As improvements to irrigation systems take place, there will be a reduction in return flow. This will help alleviate drainage problems in some areas. Drainage needs should be monitored and reevaluated after installation of the project. Some drainage may be necessary to maintain crop yields. An ongoing water quality monitoring program is currently in progress.

Continuation of Ongoing Programs (Plan One)

Projections for this alternative are based on records of onfarm improvements installed in the recent past. They assumed that irrigation system improvements will be installed at the same annual rate until the year 1990. It is also assumed that irrigation water management improves at an accelerated rate. This established a base in 1990 against which to compare future conditions with various alternative plans.

A total of 19,700 acres of sprinkler systems and 3,840 acres of improved surface irrigation systems would be installed. This results in a projected salt reduction of 21,000 tons in the Colorado River and an increase in flow of 5,600 acre-feet. This reduces the salt concentration of the Colorado River by 2.8 milligrams per liter at Imperial Dam or allows the water quality at Imperial Dam to be maintained while developing an additional 23,700 acre-feet of water.

This alternative impacts 5,180 acres of wetland wildlife habitat having an acre value of 2,041 which is converted to upland. It has the least effect of any alternative on salinity reduction and wildlife habitat.

Farmer Identified Irrigation Improvements (Plan Two)

Under this alternative, farmers identified the onfarm irrigation system improvements and management that should be installed on their farms to increase irrigation efficiencies. This evaluation determined the amount of

improved surface irrigation systems and sprinkler systems that would be installed. The remaining acres are assumed to have no change from future without accelerated programs.

A total of 65,000 acres of sprinkler systems and 63,300 acres of improved surface irrigation systems would be installed. This results in a salt reduction of 82,900 tons in the Colorado River and an increase in flow of 9,900 acre-feet. This reduces the salt concentration by 9.8 milligrams per liter at Imperial Dam or allows the water quality at Imperial Dam to be maintained while developing an additional 81,200 acre-feet of water.

This alternative proposes changing 15,000 acres of wetland wildlife habitat with an acre value of 5,810 to upland. It also creates an additional 18,290 acres of upland habitat.

Maximum Potential Irrigation Improvements (Plan Three)

This alternative assumed that the maximum level of improvements would be based on the most efficient irrigation systems for each soil type. The soils were grouped into categories with similar characteristics. Taken into account were the slopes, topography, intake rates, soil depth, water table, soil salinity, field size and shape, and power requirements for pumping. The irrigation system improvements that give the highest irrigation water management level for each soil category were determined. From this information, the maximum number of improved surface systems and maximum number of sprinkler systems was determined. Treatment on some land is not considered feasible because saline soils limit production. This is generally true for saltgrass pasture.

A total of 107,500 acres of sprinkler systems and 37,200 acres of improved surface irrigation systems would be installed. This results in a salt reduction of 98,900 tons in the Colorado River and an increase in flow of 19,100 acre-feet. This reduces the salt concentration in the Colorado River by 12.5 milligrams per liter at Imperial Dam or allows the water quality at Imperial Dam to be maintained while developing an additional 104,200 acre-feet of water.

This alternative gives the maximum net monetary benefit. It also has the greatest salinity reduction but requires the largest use of energy for operation of the sprinkler system. This alternative changes 22,470 acres of wetland wildlife habitat with an acre value of 8,663 to upland. It also creates an additional 24,600 acres of upland habitat.

Total Land Retirement (Plan Four)

An alternative of retiring all irrigated land in the Uintah Basin Unit was considered. This alternative would have enormous impacts. Total onfarm and conveyance system effects would be a salt reduction of 220,000 tons in the Colorado River and an increase in flow of 447,000 acre-feet. This would reduce the salt concentration by 75 milligrams per liter at Imperial Dam.

Approximately 60,000 acres of wetland habitat associated with return flows would be lost. The 182,300 acres of upland habitat on irrigated land would convert to a more arid type habitat. Significant changes in wildlife species would occur.

All irrigated agricultural benefits in the basin would be lost. This would have significant impacts on all social aspects of the area.

This alternative is not considered feasible since it was not locally acceptable.

Partial Land Retirement (Plan Five)

Another alternative assumed the poor quality land could be retired from production. We assume that for such an alternative that the water right for the retired land would be forfeited and the water released to the streams. This alternative was presented to water users in development of the alternatives. Due to shortage of water during the late season, this alternative was not popular with the irrigators. They would consider retirement of saline land, but would not consider retirement of any water right. This makes this alternative nonviable, and computations of impacts for the entire Uintah Basin Unit were not pursued. In addition, since water rights determinations are outside USDA authority, we cannot propose any viable alternative that would relocate a specific amount of saved water. If the saved water is used on dryland irrigable acres the USDA will assist those private landowners with conservation measures to efficiently apply water so that salinity benefits are realized.

Nonstructural Management (Plan Six)

A plan with only management elements was considered. This included practices such as irrigation water management, conservation cropping systems, and pasture and hayland planting. It was determined that most water users need the structural improvements as a part of better management.

Recommended Plan (Plan Seven)

This alternative was developed in meetings with local irrigation company officials. Five meetings were held during November 29 through December 1, 1977. These meetings were held in Duchesne, Roosevelt, LaPoint, and Vernal.

At these meetings, the alternatives were presented and the expected results of each discussed. The necessary pumping costs were part of the information presented. After the discussion, one alternative, or combination of alternatives, was selected by representatives from each evaluation unit. This plan was selected to best fit each area and be a plan that is acceptable to the local water users. This makes it an implementable plan and the most practical for each evaluation unit.

The selected plan for the entire Uintah Basin Unit is a composite of the nine evaluation units. It consists of the installation of 79,400 acres of sprinkler system and 42,800 acres of improved surface irrigation systems.

Table V-1 shows the amounts of each type of improvement for each alternative. The selected plan (122,200 acres) has less acres of new sprinkler systems and more acres of improved surface systems than the potential development plan. This is due to several factors. Some soils are suited to several methods of irrigation even though one type was determined to be the best. Also, there are inclusions of other soil types in each mapped soil group.

Implementation of the selected alternative will convert 19,860 acres of wetland habitat with a per acre value of 7,660 acres to upland habitat.

Table V-1

UINTAH BASIN SALINITY STUDY
ONFARM SYSTEM IMPROVEMENT SUMMARY
(All units are shown in existing irrigated acres.)

<u>Method of System Improvement</u>	<u>Continuation of Ongoing Programs</u>	<u>Farmer Identified Improvements</u>	<u>Potential Irrigation Improvements</u>	<u>Recommended Plan</u>
1. <u>Surface</u> - Some border - deep soil, slopes less than 2% and uniform, large fields.	3,000	40,600	25,900	23,300
2. <u>Surface</u> - Deep soil, slopes 1 to 4% and undulating, some water table and salt problems.	840	22,700	11,300	19,500
3. <u>Sprinkler</u> - Mainly gravity pressure - deep soil, slopes 2 to 5%, fields small and often long and narrow.	8,000	7,600	17,600	16,800
4. <u>Sprinkler</u> - Some pumped pressure - same as 3, except more pumping required, also shallow soils with hardpan, undulating, and high intake rates.	9,700	55,400	87,000	59,700
5. <u>Sprinkler</u> - Mainly pumped pressure - center pivot - deep sandy soil, low AWC, large fields, undulating topography.	1,500	2,000	2,900	2,900
Subtotal ^{1/}	23,040	128,300	144,700	122,200
Present	10,200	10,200	10,200	10,200
Untreated	149,160	43,900	27,500	50,000
Idle	20,800	20,800	20,800	20,800
TOTAL	203,200	203,200	203,200	203,200

^{1/} Total Area to be treated.

Figure V-2 shows the general locations of the five general types of irrigation systems. Site specific designs will ensure that proper systems compatible with the soils are installed. These improvements, along with the associated management practices, can adequately treat 84 percent of the potentially treatable lands.

The selected plan results in a salt reduction of 76,600 tons in the Colorado River and an increase in flow of 20,200 acre-feet (Table V-2). This reduces the salt concentration by 10.3 milligrams per liter at Imperial Dam or allows the water quality at Imperial Dam to be maintained while developing an additional 86,000 acre-feet of water.

Nondiscrimination

The salinity control program will be carried out in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 CFR 15.1-15.12), which provides that no person in the United States shall, on the grounds of race, color, national origin, sex, religion, age, physical or mental handicap be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving Federal financial assistance.

Monitoring

Irrigation water management is being evaluated to determine if the available irrigation water supply is used effectively to meet the moisture requirements of the crops. Water quality monitoring will include both surface water and ground water quantity and quality.

The present major land uses and vegetative cover types in the Uintah Basin have been inventoried using high altitude photographs and photogrammetric techniques. A program is being formulated to measure the changes periodically in the future.

The ongoing quality planning procedure will insure implementation of conservation measures included in the long term agreements.

Mitigation

Under the present authority of USDA the most likely scenario for mitigation is a voluntary commitment on individual or contiguous farms. This commitment could result in an acreage with an acre-value less than a full level of mitigation. It will be accomplished by avoiding areas, minimizing adverse effects, upgrading (rehabilitation), or replacement. USDA will make every effort to work with cooperators to include wildlife practices in their conservation plans. However, it is unknown at this time the amount of voluntary mitigation that will occur. A Memorandum of Understanding now exists between the SCS and the ASCS in which ASCS agrees to make cost-sharing for salinity control practices conditional upon the farmer installing, the associated wetland and wildlife practices which are in the conservation plan of operations. Conservation measures are being applied only on those lands which have not been cultivated four of the last five years. Wetlands are not being drained to convert them to other uses.

Table V-2

UINTAH BASIN UNIT
Summary Comparison of Alternative Plans

Economic ^{1/} Environmental or Social Factors	Units	Continuation of Ongoing Programs	Farmer Identified Improvements	Potential Irrigation Improvements	Recommended Plan
Installation Cost	(\$)		68,088,800	75,137,000	64,474,200
Annual OM&R Cost	(\$)		1,307,400	1,570,700	1,284,200
Annual Cost	(\$)		7,348,900	8,237,600	7,005,000
Annual Benefits (onsite)	(\$)		7,746,400	8,822,100	7,532,600
Annual Benefits (offsite)	(\$)		4,787,300	6,132,200	5,052,100
Wetland Habitat	(Ac.)	48,760	30,580	26,290	28,900
Upland Habitat	(Ac.)	182,300	200,480	204,770	282,160
Salt Load Reduction	(Tn)	21,000	82,900	98,900	76,600
Streamflow Increase	(Ac-Ft)	5,600	9,900	19,100	20,200
Change in Salinity Concentration at Imperial Dam	(Mg/l)	-2.8	-9.8	-12.5	-10.3
Irrigation Efficiency					
1) Conveyance	%	79	79	79	79
2) Onfarm	%	38	50	55	51
Gross Crop Production	(\$)	11,394,100	15,786,000	16,743,300	15,551,300
Crop Yields					
Alfalfa	T/Ac	4.0	4.6	4.7	4.6
Pasture	AUM/Ac	5.2	6.9	7.2	6.8
Sm. Grain	Bu/Ac	67.0	75.0	76.0	75.0
Corn Silage	Tn/Ac	17.0	19.0	19.0	19.0

^{1/} July 1980 Price base.

The wildlife practices are available at a 75 percent cost-share rate on long term agreements, and at 90 percent cost-share on annual agreements. The USDA agencies work with the Utah State Division of Wildlife Resources and with the U.S. Fish and Wildlife Service in the development of the individual conservation plans.

A second mitigation scenario would be for the USDA wetland mitigation options to be included in the off-farm mitigation plan. They could be included in the Bureau of Reclamation report, which will eventually be submitted to the Congress for authorization and funding, but there are no present plans for such an arrangement. Farmers would be able to do much for wildlife habitat if funds were available to them for wildlife practices.

A third mitigation scenario, which is outside the jurisdiction and present authority of USDA, would be for Congress to fund the USDA wetland mitigation directly. It could be implemented at the time Congress approves the ASCS, Agricultural Conservation Program, or other funding for the salinity control practices. It would be desirable if this type of funding were used for habitat improvement on blocks of land (purchased or obtained by wildlife easement), rather than on the individual farms or contiguous farms where the salinity control practices are applied. However, this would require additional authorities if ASCS were to handle the cost sharing and provisions for operation and maintenance. Public ownership or management by lease or other arrangements may be necessary to assure adequate development and long life of such areas for mitigation purposes. It would also be necessary to overcome the problems of water rights, operation and maintenance and taxation of the wetlands devoted to mitigation.

Conflicts

The concepts of mitigating or replacing the loss of irrigation-induced wetland habitat and of reducing the salt load carried by the Colorado River present conflicting environmental values. The Colorado River Basin Salinity Control Act, Public Law 93-320 firmly establishes that the purpose of salinity studies is to develop alternative actions to reduce the salt load carried by the Colorado River. Much of the salt load is attributed to seepage and deep percolation from irrigation systems and practices throughout the valley. These same inefficient irrigation systems and practices are the source of water for some wetlands in the valley. As seepage from the irrigation systems is reduced and as irrigation efficiency is increased, some of these irrigation-induced wetlands will be unavoidably lost. In contrast, there is a basis for wetland protection and mitigation established in the regulations for compliance with NEPA, Executive Order 11990 and USDA Policy. Therefore the concept of replacing lost wetland habitat and reducing the salt load carried by the Colorado River presents the conflict between the environmental values of improved water quality and wildlife habitat.

The value of wetlands varies with type of vegetation, water quantity and quality, and man's activities. The value of a given wetland area can be measured by comparing it with an acre of the same type in excellent condition. The amount and quality of replacement habitat needed is also based on its acre value. Thus, mitigation will not be an acre for acre replacement but will consist of those actions taken to make the change less harsh or severe.

The Soil Conservation Service was aware of the conflict between the competing environmental values of water quality and irrigation-induced wetlands when it

developed its wetland policy (7 CFR 650.26) in compliance with Executive Order 11990. As a result the SCS wetland policy was written to allow for certain policy exceptions, if necessary, to meet identified irrigation water management (water quality and water conservation) objectives. However, as previously indicated, SCS will make every effort to work with cooperators to include wildlife practices in their conservation plans.

C. Affected Environment

Location

The Uintah Basin Unit is located in the northeastern part of the State of Utah (Figure V-1, Location Map) in parts of Uintah, Duchesne, and Wasatch Counties. It is made up of the Ashley Creek, Brush Creek and the Duchesne River drainages.

A complete description of the study area is found in the January 1979 U.S.D.A. Uintah Basin Unit Salinity Report as revised by the November 1980 Addendum.

Physiography and Geology

Most of the study area lies within the western part of the Uintah Basin of the Colorado Plateau Province. ^{1/} The Uintah Basin is a structural depression that lies between the Uinta Mountains on the north and the Tavaputs Plateau on the south. It is dissected by many streams. The following different kinds of relief are scattered throughout the basin: (1) smooth, gently sloping benches or mesas; (2) alluvial valleys dissected by streams; (3) alluvial fans and foothill slopes that lie between the bases of mesas and the valley plains; (4) rolling uplands; and (5) steep, rough, broken and eroded lands.

Most of the basin floor is between 5,000 and 6,000 feet above sea level. The lowest elevation is 4,655 feet at Ouray. The highest elevation at which crops are grown is about 7,000 feet above sea level near Mountain Home. Most of the irrigated land occurs on the lower benches and mesas, and in the alluvial valleys.

The Pleistocene deposits are mainly terrace and pediment gravels and glacial outwash from the Uinta Mountains. These deposits are nonsaline.

The Duchesne River formation, of late Tertiary age, occurs in the northern part of the basin. It consists of interbedded red, brown and varicolored clay-shales. It is typically not a saline formation and is a low salt producer.

The Uinta formation occupies the central and southern part of the basin and is composed mainly of saline and gypsiferous clay stone, shales, sandstones, and marlstone. This formation is the predominant salt producer in the Uintah Basin.

^{1/} Fenneman, New Mexico, Physiography of the Western United States. 1938 -

The Green River formation occurs in the southern part of the basin. It consists of sandstone, siltstone, shale, and limestone. This formation includes oil shale deposits and is high in mineral and salt content.

The Mesa Verde formation of Cretaceous age is limited in extent. It consists of marine sandstones with occasional shale tongues. Water from petroleum test wells in this formation is very saline to briny.

The Mancos formation is Cretaceous in age. It is exposed mainly in Ashley Valley. This formation is dark gray, saline and gypsiferous clay stone. Infiltration of precipitation is virtually inhibited. Any water that issues from this formation is saline.

Soils

The soils of the project area are derived from six different geological formations (sources) strongly influencing their productivity and behavior.

The lack of distinct horizons (layers) within the soil profile indicates the relatively short time that many of the soils have been in place. However, the soils on the benches and mesas with lime hardpans and distinct white layers of accumulated lime indicate these soils have been in place a longer period of time. The low annual precipitation and resultant scant vegetation have produced soils typically found in deserts--low in organic matter content, high in weatherable minerals and associated salts.

The Roosevelt-Duchesne area soil survey was completed in 1940. Some rechecking for drainage and salinity in 1954 showed an increase in saline areas since 1940. The final report was issued in 1959. All of the irrigated area is covered by this report, except Ashley Valley and the Pelican Lake area. A soil survey of Ashley Valley was completed in 1977. A soil survey of the Pelican Lake area in 1976 updated the changes in soil conditions, especially drainage and salinity. In this area, many acres of land have been put under irrigation in recent years.

Climate

The temperatures in the Uintah Basin vary from extremely cold in the winter to hot in the summer. Daily temperatures, from the nighttime low to the daytime high, can vary as much as 40 degrees Fahrenheit. The seasons are well defined. Winter storms result from moist Pacific air associated with frontal systems moving eastward across the basin. Winter precipitation falls mostly as snow, while thunderstorm activity dominates the summer season.

Summer precipitation is associated with the northerly flow of warm, moist air originating in the Gulf of Mexico. These summer thunderstorms are of high intensity, but limited in area. Flash flooding and erosion damage occur during these storms.

The average annual precipitation ranges from less than 7 inches near Ouray to about 40 inches in the high mountains. Irrigation is essential in the cropland areas.

The frost-free period, or consecutive days with a minimum temperature above 32 degrees Fahrenheit, increases as elevation decreases. Three Weather Bureau

data stations (Duchesne, Vernal, and Roosevelt) were used to evaluate climatic conditions.

	<u>Units</u>	<u>Vernal</u>	<u>Duchesne</u>	<u>Roosevelt</u>
Elevation	feet	5,280	5,520	5,102
Average annual precipitation	inches	7.82	8.71	7.44
Mean annual temperature	°F	44.5	43.2	46.5°
Frost-free period	days	120	115	125

Water Supply

The quality of water entering the Uintah Basin Unit from the major streams is excellent. However, once the water is used for irrigation, there is a sharp increase in the mineral content. This is especially true where the Uinta Geologic Formation is exposed because the formation contains many beds of gypsiferous salts that readily dissolve in water.

Minor streams originating in the southern part of the basin (Badland Cliffs region) consistently carry sodium sulfate (Na_2SO_4). Additional sodium sulfate salts are picked up from the floodplain of the Duchesne River.

Land Use

There is a total of 2,911,000 acres within the Uintah Basin Unit. Land ownership is as follows:

National Forest Lands	1,219,000 acres
National Resource Lands	151,000 acres
Wildlife Refuge	12,000 acres
Private (Indian and non-Indian Lands)	1,471,000 acres
State Lands	<u>58,000 acres</u>
Total	2,911,000 acres

There are about 205,000 acres of private irrigated cropland and pastureland of which about 21,000 acres are idle in any given year.

The principal crops grown in order of acreages are pasture, alfalfa, small grains, and corn for silage. The 1974 Census of Agriculture shows the average size farm in Uintah County is 3,400 acres with 130 acres irrigated. In Duchesne County, the average farm size is 740 acres with 170 acres irrigated. There are no irrigated lands in the Wasatch portion of the Unit.

Agriculture is still an important aspect of the Uintah Basin Unit economy. Cattle, sheep, wool, milk, hay, and other feed crops are the major agricultural products. Grazing by livestock is a major use of farmlands. Nearby National Forest and National Resource lands also provide grazing.

Erosion and Sedimentation

Studies of the area and the irrigation systems indicate sediment production from the irrigated fields is less than 25,000 cubic feet per 1000 acres per year. Overall, the 205,000 acres of irrigated lands in the Uintah Basin Unit are contributing about 2.5 billion cubic feet of sediment to the river system each year. Drainage channels will also have reduced flows and less erosion.

Rangelands in the low rainfall area of the project area have erosion rates that are significant. Badland areas that are steep shale hills contribute about 50 percent of the sediment to the stream system in the Uintah Basin Unit area. Cropland areas contribute a small percentage of the remaining sediment so impacts of conservation measures on erosion will be minor.

Runoff from the forested areas contains little sediment throughout most of the year. Periods of high runoff from the forested area produces less than one percent of the sediment conveyed to the Green River.

History

The Uintah and Ouray Indian Reservation was established by Executive Order of President Lincoln on October 3, 1861. Between 1902 and 1905, reservation lands were allotted in severalty to the Indians and the unallotted lands returned to the Public Domain. As a result, Indian and non-Indian lands were interspersed. Many of the present administrative and water rights problems had their beginnings in this dismemberment of the Indian Reservation.

In 1905, the U.S. Government opened the lands for homesteading. In that year, the first non-Indian settlers arrived in the Duchesne River area. That same year two irrigation groups filed for water rights in the Duchesne area.

The first irrigation systems were relatively small projects constructed with horse drawn plows and scrapers. Larger and longer canals were installed as the demand for land water grew.

Two units of the Central Utah project were built in 1962 and 1970 by the U.S. Bureau of Reclamation. Additional units of this project are in various stages of planning and application.

Socioeconomic

Nearly all the irrigated lands and nearly all the population of Duchesne and Uintah Counties are in the Uintah Basin Unit. The total population of the two counties in 1970 was 19,983. There was a 20 percent decline in population of Duchesne County from 1940 to 1960. This decline is largely attributable to a diminishing need for agricultural labor. In the same period, Uintah County's population remained stable through an economy based more on tourism and oil exploration.

The rapidly increasing population of Duchesne and Uintah Counties since 1970 is the result of the oil boom in the Uintah Basin Unit and construction of the Central Utah Project. In some towns, this influx has increased the population as much as 50 percent. The advance 1980 Census data show 33,071 people in the two counties. This influx has leveled off, but a sustained, although lower, growth rate is anticipated through the year 2000.

The population distribution in the two counties by race is as follows:

County	White	Black	Native American	Asian and Pacific Islander	Other	Total
Duchesne	12,175	2	292	29	67	12,565
Uintah	18,319	6	1,952	47	182	20,506
Total	30,494	8	2,244	76	249	33,071

Very few full-time farmers are minorities--there are about a dozen women farmers and a few Indian farmers. Most of the farmland owned by Indians is leased. The minorities are scattered throughout the basin. One group plan currently being developed for about a dozen farmers on Farm Creek has about 6 or 7 Indian participants in the group.

The 1974 Census of Agriculture showed 97,600 beef cattle and calves, 4,600 milk cows, and 52,900 sheep in the Uintah Basin Unit. The market value of agricultural products sold in the basin was about \$15,300,000 in 1974.

Oil shale development and mining of gilsonite, bituminous sandstones, and phosphate rock will continue to have a marked impact on the economic growth and development of the basin.

Historical and Archeological Resources

There are 55 historic sites, 199 archeological sites, and four unique natural areas in the near vicinity of the study area.

The historic sites include buildings, cemeteries, and forts. One site, Fort Robidoux, established in 1837 or 1838, is said to be the oldest white habitation site in Utah. Five historic trails pass through the area. They are Ashley, Powell, Fremont, Escalante, and the Old Spanish Trail.

Archeological sites vary from surface scatters of chipping debris to entire villages. One site, the Caldwell Village, contains 22 large pit houses and an alleged irrigation ditch.

Unique natural areas include Dinosaur National Park, Asphalt Ridge, numerous interconnected sink holes and springs, and the Uinta Mountains.

Biological Resources

The Uintah Basin Unit is a diverse, as well as large, ecosystem and the variations in climatic conditions, elevations, and land uses provide habitat for a variety of wildlife species. The area is characterized by cropland, pasture, upland and desert rangeland, some woodland, riparian and wetland habitats.

There are about 90 mammal species known to occur in the basin. Many of these animals utilize the irrigated lands in the study area. The varied topography in the basin limits the amount of land that can be irrigated and farmed. Those areas that are suitable for irrigation are dissected by many natural draws and streams. In addition, circuitous routes are required to bring irrigation water to these lands. This creates a highly diversified and varied

water associated habitat in and adjacent to the croplands. The only habitat diversity on cultivated fields themselves is provided along fence rows and along field ditches.

Over 140 species of birds have been identified in the basin and 48 of these are residents of the irrigated lands which nest in the general area. The most abundant kinds are blackbirds and sparrows. Other species using these areas are ring-necked pheasant, sage grouse, quail, mourning dove, western tanager, starling, and house finch.

Much of the riparian and wetland habitat exists because of agricultural development. In some areas of the basin the irrigation supported wetland habitat is all that is available, and little or no natural wetland habitat remains. Water which seeps from earthen canals and ditches often saturates the soil and supports hydrophytic and phreatic plants. Open drains in these areas also support hydrophytic and phreatic plants. Return flows from irrigated land contributes to natural drainages which supply native existing wetlands and create new areas.

The riparian and wetland habitats found in and around the irrigated lands and those associated with the river bottoms probably receive the highest use by wildlife. The diversity of water, trees and moist areas contribute to the species diversity of the area. It is estimated that over 60 percent of all the birds found in the study area use this type of habitat.

Hunting and fishing play an important role, both in the local economy and on the wildlife resources of the area. Mule deer, pheasants, mourning doves, and cottontail rabbits are the most sought after game species. Hunters spend nearly 40,000 days annually in pursuit of upland game species within the basin. In addition, 6,500 waterfowl hunting trips are made annually.

The peregrine falcon, bald eagle, whooping crane, and black-footed ferret are on the Federal List of Endangered Species. The entire State of Utah is historic bald eagle and peregrine falcon range. No known peregrine falcon nesting sites occur in or adjacent to the irrigated area in the Uintah Basin Unit. The bald eagle is a winter visitor and is not in the basin during the nesting season. The black-footed ferret is known to have occurred in the basin. Recently, whooping cranes which have been raised under sandhill cranes and are flying with them, have been reported in the Uintah Basin Unit.

The endangered Colorado squawfish, Boneytail chub, and Humpback chub occur in the Green and Colorado Rivers and may be in the project area.

One species of threatened cacti, the Uintah Basin hookless cactus (*sclerocactus glaucus*) is known to occur in the basin. It occurs on alluvial deposits in open rocky noncultivated areas.

A substantial fishery resource exists in the Uintah Basin Unit. Drainages from the south slopes of the Uinta Mountains have been evaluated ^{2/} as high priority fishery resources for high interest species. High interest species are defined as sport or game fish or species that are low in numbers or species that have high professional or biological interest. Waters in the lower portions of the valley have been evaluated ^{2/} as substantial and limited fishery resource.

^{2/} Utah Stream Fishery Values, R.S. Sydoski and C.R. Berry, Jr.

Habitat in these stretches are used occasionally to sporadically by species of high interest. The Utah State Division of Wildlife Resources (DWR) has ranked fishery habitat in the basin based on esthetics, availability, and productivity.

The classification is arranged with class I as the best and class VI as the poorest. The following is a summary of fishery habitat by class and does not include waters of the high Uinta Mountains:

<u>Class</u>	<u>Lakes</u>	<u>Streams</u>
I (best)	8,400 acres	10 miles
II	7,046 acres	42 miles
III	874 acres	347 miles
IV	0	445 miles
V	50 acres	3 miles
VI (poorest)	0	0

D. Environmental Consequences of the Recommended Plan

Introduction

Impacts caused by implementation of individual onfarm water management and land treatment measures are generally minor. However, when these measures are implemented throughout the entire Uintah Basin, the cumulative impacts become more significant. These impacts will be addressed and quantified in this section. Primary impacts will occur on wetlands that have developed since irrigation was first introduced in the valley. As irrigation systems are made more efficient the wetland areas dependent on water from these sources will diminish.

Displays of effects of program implementation on the environment as required by the Water Resource Council's Principles and Standards are found in Tables V-5 through V-9.

Changes in Air Quality

Impacts on air quality will be temporary and minor. They will consist of dust, noise and exhaust smoke from construction and farm equipment. Equipment use will be scattered on small projects throughout the basin.

Water Quantity and Water Rights

Implementation of the onfarm land treatment and irrigation water management practices in the recommended plan will improve average onfarm irrigation water application efficiencies from 34 to 51 percent (Table V-3, Appendix A).

System designs will generally limit the amount of water conveyed through the systems to the amount needed to satisfy crop demands.

Water Quality

The realization of salinity reduction benefits from implementation of onfarm conservation measures depends on reduction of deep percolation and seepage beyond the root zone.

The net effect of implementation of the onfarm measures is a reduction of 76,600 tons of salt to the Duchesne and Green river systems as shown in the salt budget (Table V-4, Appendix G). This results in salt reduction of 10.3 mg/l in the lower Colorado River at Imperial Dam. The details of water quality effects by evaluation unit are contained in the January 1979 U.S.D.A. Uintah Basin Unit Salinity Report (revised November 1980).

There will be no measurable effect on the deep ground water bodies. Consequently, there will be reduced the opportunity for soluble salts in the underlying geologic formations to be transferred to adjacent streams.

Water Table Alterations

Implementation of the onfarm measures will improve onfarm conveyance and application efficiencies and reduce the contribution to the water table. In areas where the irrigation water is the direct cause, the high water table will be lowered.

Changes in Flow Regime

The USDA Salinity Report for the Uintah Basin Unit projects the following average annual changes in downstream flow as a result of the program:

<u>Subunits</u>	<u>Downstream Flow Depletion/Accretion</u>	<u>Acre-feet</u>
Ashley Valley	accretion	7,300
Brush Creek	accretion	1,100
Whiterocks	depletion	1,000
Pelican Lake	depletion	400
Dry Gulch	depletion	11,000
Upper Lake Fork	accretion	3,700
Arcadia	accretion	2,200
Lower Duchesne	accretion	16,100
Upper Duchesne	<u>accretion</u>	<u>2,200</u>
	accretion	20,200

The Whiterocks and Dry Gulch outflows come together near Randlett about 3 miles before they flow into the Duchesne River. The flow depletions are significant to the Dry Gulch and Whiterocks channels between the irrigation diversions and the Duchesne River.

The combined increase of the Upper Lake Fork, Arcadia, Upper and Lower Duchesne Units is about 24,000 acre-feet. When the flow of the Duchesne, with a 24,000 acre-foot increase, and the Whiterocks, with a 12,000 decrease, combine near Randlett it results in a 12,000 acre-foot net increase to the Duchesne River between this junction and the junction with the Green River at Ouray.

Changes in Land Use

No direct changes in land use will be made. No new farm land will be brought into production. Cropland producing alfalfa and small grains will receive a more adequate water supply better timed to crop needs. Suitable areas, as agreed to by the farmers, will be fenced and/or otherwise managed for wildlife.

Erosion and Sedimentation

The proposed irrigation improvements will have a slight effect on overall erosion in the basin. Pipelines used to develop pressure for sprinkler irrigation will eliminate some steep lateral sections eliminating erosion for the life of the proposed pipelines. Other pipelines and canal lining sections are proposed through areas of highly saline soils which have very little vegetative cover, thus erosion will be prevalent. Lining of these lateral sections will eliminate erosion for the life of the proposed measure along the lined section of the canal.

Other areas of erosion exist on fields that are steep and have not developed a protective cover. Erosion is not a significant problem in the irrigated area.

Appearance of the Landscape

The visual appearance of the basin will be modified with implementation of the onfarm land treatment and management measures. More than 1,500 miles of onfarm earthen ditches will be replaced by sprinkler systems irrigating 79,400 acres. Associated ditchbank vegetation will be eliminated. Disturbed areas will be reseeded. Some additional permanent vegetation will be established along pipelines and laterals. More efficient use of existing irrigation water supplies will decrease the bare earth exposed and increase the total amount of vegetation contrast. The entire basin will have a more managed appearance as the irrigation systems are improved and soil and water management practices are implemented.

Stream Fisheries

The implementation of onfarm land treatment and management measures will have no adverse impact on sport or game fish species. Irrigation diversion structures will not be disturbed nor will the amount of water diverted be increased. Plan implementation will actually require less water to be diverted. The actual amount of water diverted will be determined by the farmers under state water laws. Part of the onfarm management program is to educate farmers to apply the water more efficiently.

Riparian Habitat and Wetlands

More efficient use of irrigation water and the associated reduction in water supply to irrigated lands will change some of the irrigation induced wetlands and riparian habitat to upland habitat. Acres converted and acre values are shown in Table V-9 (Appendix C-5). Wildlife habitat maintenance and improvement features will be accomplished through long term agreements with individual farmers. Of the total 48,760 acres of wetland habitat in the basin, 13,000 acres having an acre value of 6,150 acres will be converted to upland wildlife habitat. About 17,000 acres are greasewood-salt cedar where

the slight lowering of the water table will have no significant impact. There will be no impact on 16,295 acres of riverine habitat which are not dependent on irrigation water for survival.

The monitoring system will be expanded to determine if reduction of irrigation seepage and return flows actually cause the projected changes to occur. Wildlife habitat changes will also be monitored to determine the effects of implementation. Wildlife habitat maintenance and improvement implemented through long term agreements with individual farmers will partially offset losses. The SCS has assigned two field biologists to the area and the U.S. Fish and Wildlife Service has detailed a biologist to the SCS field office to assist in planning wildlife habitat maintenance and improvement practices. Measures to be installed for salinity and wildlife are selected by landowners on a voluntary basis.

Upland Wildlife Habitat

There will be 1,870 acres of upland wildlife habitat disturbed during implementation of the onfarm land treatment and management measures. These areas have present acre value of 630 acres. Much of this habitat is associated with the 1,540 miles of onfarm earth ditch which will be eliminated. Better farm crops with small grain and corn added to the rotation will provide a better food source for upland game birds. Field observations indicate that the onfarm delivery ditches do not offer much diversity since most of them are grazed by livestock along with the fields. Chemical, mechanical and fire control methods are used frequently to suppress vegetative growth along these ditches. Most ditches are located within the fields. Calculations used to determine acreage assumed a ten-foot wide right-of-way.

Threatened and Endangered Animals and Fish

There are no recent sightings of black-footed ferrets in the Uintah Basin Unit. There are concentrations of prairie dogs which have the potential to support black-footed ferret populations. Most prairie dog populations occur on rangeland and will not be affected by implementation of onfarm measures. Some prairie dog populations could slightly decrease through elimination of isolated poorly irrigated areas by improved irrigation efficiency. This could have an unknown effect on any black-footed ferret population.

Bald eagles use the Uintah Basin Unit for winter habitat. The land treatment measures planned for the salinity program include intensive efforts to establish a voluntary wildlife habitat preservation and enhancement program. Those species being considered are pheasant, waterfowl, fish and rabbits which comprise the major food source of the bald eagle. Perch trees (cottonwoods) are found throughout the basin. These are critical for the bald eagle in feeding areas. In those areas where a few trees could possibly be destroyed through plan implementation, losses will be compensated for with artificial perches or cottonwood transplanting. Therefore, no negative impact should be incurred by the bald eagle through implementation of the Salinity Program.

Onfarm treatment and management practices initiated through the Salinity Program will not have any negative impact upon the peregrine falcon. Areas supporting feeding and potential nesting habitat will not be affected by any of the treatments, as most, if not all, are outside the area.

Whooping cranes occur in the basin as a result of the foster parent rearing program at Gray's Lake, Idaho. Juvenile whoopers and their sandhill parents use irrigated cropland areas near Jensen for summer habitat.

The implementation of the Uintah Basin Unit Salinity Control Program will have no significant impact on the whooping crane. Whooping cranes tend to migrate to the place of their birth upon maturity so possible reduction in wetland acreages will not have an impact on nesting habitat. Improved crop production should increase and improve feeding areas and thus improve the area for feeding and resting during migration.

The Colorado River Basin Salinity Control Program, Uintah Basin Unit, will result in a net accretion to flow in the Colorado River of approximately 20,200 acre-feet. Although tolerances of the endangered fishes for temperature, turbidity, salinity and flow changes have not been determined, the project is not expected to affect any of the endangered species. All have been recorded as living in areas with extensive variations in salinity and flow regime.

The Soil Conservation Service has entered into formal consultation with the U.S. Fish and Wildlife Service in accordance with Section 7(c) of Public Law 95-632, the Endangered Species Act Amendment of 1978. The Uintah Basin Biological Assessment was transmitted to the U.S. Fish and Wildlife Service on February 23, 1981. On April 9, 1981, the U.S. Fish and Wildlife Service responded with the biological opinion:

"The proposed Uinta Basin On-farm Salinity Program together with the proposed Martin Lateral Land Treatment Watershed as described by the Soil Conservation Service (SCS) is not likely to jeopardize the continued existence of the Uinta Basin hookless cactus (Sclerocactus glaucus), black-footed ferret (Mustela nigripes), bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus anatum), whooping crane (Grus americana), Colorado squawfish (Ptychocheilus lucius), bonytail chub (Gila elegans), and humpback chub (Gila cypha)."

In addition, the U.S. Fish and Wildlife Service response stated: "We concur with the biological assessment that the salinity program will not adversely affect the habitat of the Colorado squawfish, humpback chub, and bonytail chub as long as the project does not result in a net depletion of flows in Ashley and Brush Creeks and the Duchesne Rivers. If the net effect of the proposed projects results in a net depletion of instream flows in the Duchesne River and Ashley and Brush Creeks the SCS should reinitiate Section 7 consultation under the Endangered Species Act."

Threatened and Endangered Plants

Only one threatened plant, the Uintah Basin Unit Hookless Cactus (Sclerocactus Glaucus), is known to exist in the Uintah Basin Unit. It exists in open stony areas on rangeland. Implementation of onfarm land treatment and management measures do not normally disturb rangeland areas. If installation of pipeline or other facilities disturb rangeland areas, an inventory will be made to determine the presence or absence of this plant. If plants exist that would be disturbed by program implementation, the work location will be changed to prevent disturbance.

Historical and Archeological Resources

There will be no effects on these resources. Known resources have been identified and improvements will be designed around them. A detailed environmental evaluation will be made of each individual action prior to installation. Appropriate cultural resource surveys will be made in accordance with the SCS Procedures for the Protection of Archeologic and Historic Properties Encountered in SCS Assisted Programs (7 CFR 656, July 18, 1977 as amended June 23, 1978). If cultural resources are located during site specific environmental evaluation or during construction, the State Historic Preservation Officer (SHPO) will be contacted to establish if the sites are eligible for the National Register of Historic Places. If any sites are eligible the SHPO, Interagency Archeological Services and the Advisory Council on Historic Preservation will be advised and given a reasonable opportunity to comment on any proposed recovery plan.

Socioeconomic Impacts

Implementation of onfarm measures will tend to stabilize the agricultural economy. Annual work years labor generated by agriculture and installation related jobs will be as follows:

Future Without Salinity Program		Alternative No. 1		Alternative No. 2		Alternative No. 3	
Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled	Skilled	Unskilled
3.3	9.3	18.2	57.2	23.2	59.5	17.4	51.2

Farm income will be improved through increased crop production. There will be some stimulation of the regional economy to supply the increased demand for materials. Irrigation pipeline production will create some additional secondary employment benefits.

E. Public Participation

The 1975 Memorandum of Agreement, supplemented in 1979, between SCS and USBR under Title II of Public Law 93-320 started SCS involvement in the Colorado River Water Quality Improvement Program. In addition a series of agency and public meetings preceded the issuance of the joint May 19, 1977, Final Environmental Statement for the Colorado River Water Quality Improvement Program.

Additional discussions, public meetings, and planning sessions were held during preparation of the USDA Salinity Report for the Uintah Basin Unit. Various aspects of the onfarm conservation measures were also covered in meetings of the Uintah Basin Association of Government, Uintah Soil Conservation District, and Council of Governments.

Public Meetings

Public meetings were held in January, May and June of 1977, and August 1980. In addition more than 15 meetings were held with other agencies and groups. There were 7 meetings with SCS representatives from district, area, state, regional, and national offices held along with many other less formal contacts.

Over 300 residents of the Uintah Basin Unit were sent letters from the SCD inviting them to participate in gathering data. Cards were sent to 289 agencies, groups and individuals inviting them to attend the environmental scoping meeting on September 9, 1980. Cards were returned by 47 of these. There were 46 who want to see a draft when it is completed and 31 actually attended the meeting. A list of 17 issues came out of the scoping meeting which have all been addressed in this supplement. A notice of the scoping meeting appeared in the Federal Register on Tuesday, August 26, 1980.

Coordination With Other Agencies, Groups and the Public

Coordination with other agencies, groups and the public is accomplished through many different methods.

The SCS study team members have contacts with other agencies and groups for their individual areas of expertise. The multi-objective planning technical team that was organized by USBR provides overall coordination. Continued coordination between SCS and USBR will insure compatibility of onfarm and off-farm improvements. There is a new interagency coordination procedure in which USBR chiefs in Provo, Utah, consult directly with the SCS district conservationists.

Additional coordination is accomplished through meetings of the Uintah Basin Association of Government (UBAG), Council of Governments (COG), Uintah Basin Soil Conservation District (UBSCD), irrigation companies, water users associations, etc.

Reference was also made during planning to the Regional Plans of UBAG and COG, UBSCD Zone Plans, the State Water Plan, the Colorado River Compact, the State Energy Plan, 208 Water Quality Plan and others.

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G. Appendices

(A) Water Budget

(B) Salt Budget

(C) Four Account Tables Displayed in Principles and Standards Format

(D) Federal Permits

Table V-3

UINTAH BASIN UNIT

Onfarm Water Budget

Col. 1 Alternative 182,400 Ac. Irrig. ^{1/}	Col. 2 Water Supply ^{2/} onfarm Ac. Ft.	Col. 3 Irrig. Eff. onfarm %	Col. 4 Crop C. U. Ac. Ft.	Col. 5 Phreatophyte C. U. Ac. Ft.	Col. 6 Return Flow Ac. Ft.
PRESENT CONDITION	549,100	34	287,400	125,500	136,200
FUTURE CONDITION WITHOUT A PROJECT	531,300	38	297,500	111,900	121,900
FARMER IDENTIFIED IRRIGATION IMPROVEMENTS INSTALLED	494,600	50	330,700	78,700	85,200
POTENTIAL IRRIGATION IMPROVEMENTS INSTALLED	477,300	55	334,600	67,700	75,000
RECOMMENDED PLAN	486,100	51	326,000	74,400	85,700

Column Descriptions:

- Col. 2. Volume of water that reaches the farm headgate after conveyance losses are subtracted.
 Col. 3. Efficiency of applying the water to the root zone.
 Col. 4. Consumptive Use = groundwater use + net irrigation requirement - deficit irrigation supply.
 Potential C.U. = 353,600 Ac. Ft. Deficits primarily seasonal shortages on perennial forage crops.
 Col. 5. Consumptive use of phreatophytes, including willows, cottonwoods, cattails, greasewood, sedges and some salt grass.
 Col. 6. Col. 2 - Col. 4 - Col. 5

^{1/} Does not include 20,800 acres remaining idle in an average year.

^{2/} During the latter part of the season crop demand exceeds water supply and irrigators set priorities on their crops. Corn and small grains get water while grass pasture and alfalfa are no longer irrigated. This reduces consumptive use even though cropping patterns and total irrigated acres do not change.

Table V-4

UINTAH BASIN UNIT

Salt Budget

Col. 1 Alternative	Col. 2 Water Not Diverted Ac. Ft.	Col. 3 Change In Return Flow Ac. Ft.	Col. 4 Net Change In River Ac. Ft.	Col. 5 Salt Pickup Tons	Col. 6 Change In Salt Pickup Tons	Col. 7 Change In Concen. mg/l
PRESENT CONDITION				177,200		
FUTURE CONDITION WITHOUT A PROJECT	+19,900	-14,300	+5,600	156,200	-21,000	-2.84
FARMER IDENTIFIED IRRIGATION IMPROVEMENTS INSTALLED	+60,900	-51,000	+9,900	94,300	-82,900	-9.8
POTENTIAL IRRIGATION IMPROVEMENTS INSTALLED	+80,300	-61,200	+19,100	78,300	-98,900	-12.5
RECOMMENDED PLAN	+70,800	-50,500	+20,200	100,600	-76,600	-10.3

Column Descriptions:

- Col. 2 From Col. 2 of Water Budget Table, change in water supply divided by net conveyance efficiency.
 Col. 3 From Col. 6 of Water Budget Table; difference in flow returning to river system.
 Col. 4 Col. 2 + Col. 3
 Col. 5 Net salt pickup from onfarm irrigation activities.
 Col. 6 Difference between present Col. 5 and alternative Col. 5.
 Col. 7 Change in salinity concentration at Imperial Dam.

(Revised November 1980)

UNITAH BASIN UNIT

National Economic Development Account ^{1/}

	Farmer Identified Improvements	Potential Irrigation Improvements	Recommended Plan
A. Beneficial Effects			
1. Value of Goods and Services			
a. Onfarm Benefits	\$11,525,600 ^{2/}	\$13,422,500 ^{2/}	\$11,190,100 ^{2/}
	4,987,600	5,927,200	4,804,800
b. Downstream Benefits	7,786,500 ^{2/}	9,936,400 ^{2/}	7,971,900 ^{2/}
	2,999,200	3,804,200	2,919,800 ^{2/}
c. Employment Benefits	1,995,700 ^{2/}	2,187,800 ^{2/}	1,844,600 ^{2/}
	847,700	921,400	757,700 ^{2/}
2. Value of External Economics			
a. Employment Stemming From Project	104,800 ^{2/}	104,100 ^{2/}	102,200 ^{2/}
	44,400	43,700	41,800 ^{2/}
Total Beneficial Effects	21,412,600	25,650,800	21,108,800
B. Adverse Effects			
1. Implementation Cost			
a. Project Installation	9,665,900 ^{3/}	10,603,900 ^{3/}	8,957,100 ^{3/}
	3,676,500	3,996,300	3,286,100
b. Technical Services	85,900 ^{3/}	96,600 ^{3/}	80,500 ^{3/}
	33,700	37,300	30,700 ^{3/}
c. Operation, Maintenance and Replacement	2,298,900 ^{3/}	2,763,100 ^{3/}	2,222,400 ^{3/}
	991,500	1,192,400	938,200 ^{3/}

^{1/} Costs were amortized at 7 3/8% for 25 years. July 1980 costs and benefits were used.

^{2/} Interest on benefits occurring during the 10-year installation period.

^{3/} Interest on cost incurred during the 10-year installation period.

	Potential			
	Farmer Identified Improvements	Irrigation Improvements	Recommended Plan	
	State of Utah	Rest of Nation	State of Utah	Rest of Nation
I. Income				
A. Beneficial Effects				
1. Value of Goods and Services				
a. Onfarm Benefits	\$11,525,600	\$13,422,500	\$11,190,100	\$7,971,900
b. Downstream Benefits		\$7,786,500		
c. Employments Benefits	1,995,700	2,187,800	1,844,600	
2. Value of External Economics				
a. Employment Stemming From Project	104,800	104,100	102,200	
Total Beneficial Effects	13,626,100	7,786,500	13,136,900	7,971,900
B. Adverse Effects				
1. Implementation Cost				
a. Project Installation	2,416,500	7,249,400	2,239,300	6,717,800
b. Technical Services		85,900		80,500
c. Operation, Maintenance and replacement	2,298,900	2,763,100	2,222,400	
Total Adverse Effects	4,715,400	7,335,301	4,461,700	6,798,300
Net Beneficial Effects	8,910,700	451,200	8,675,200	1,173,600
II. Employment				
A. Beneficial Effects				
1. Increase in Jobs				
a. Construction	88 man yrs.	98 man yrs.	83 man yrs.	

1/ Costs were amortized at 7 3/8% for 25 years. July 1980 cost and benefits were used.

UINTAH BASIN UNIT

Social Well-Being Account 1/

	Farmer Identified Improvements	Potential Irrigation Improvements	Recommended Plan
A. Real Income Distribution			
1. Create Jobs for 10 year period	88	98	83
2. Create regional income benefit (\$)	13,521,300	15,610,300	13,034,700
3. Local costs to be borne by region (\$)	4,715,400	5,414,100	4,461,700
4. Distribution by Class			
a. Adjusted Gross Income			
Less than \$5,000 (%)	23	23	23
\$5,000 to 10,000 (%)	44	44	44
\$10,000 to 15,000 (%)	22	22	22
More than 15,000 (%)	11	11	11
b. Benefits			
Less than \$5,000 (%)	10	10	10
\$5,000 to 10,000 (%)	15	15	15
\$10,000 to 15,000 (%)	50	50	50
More than 15,000 (%)	25	25	25
c. Expenses			
Less than \$5,000 (%)	10	10	10
\$5,000 to 10,000 (%)	25	25	25
\$10,000 to 15,000 (%)	50	50	50
More than 15,000 (%)	15	15	15

B. Life, Health & Safety

Reduce salt content in water used by 17 million downstream residents in California, Arizona, Nevada, and Republic of Mexico

Reduce salt content in water used by 17 million downstream residents in California, Arizona, Nevada, and Republic of Mexico

Reduce salt content in water used by 17 million downstream residents in California, Arizona, Nevada, and Republic of Mexico

1/ Costs were amortized at 7 3/8% for 20 years. July 1980 cost and benefits were used.

UINTAH BASIN UNIT

Summary Comparison of Alternatives

ACCOUNT	CONTINUATION OF ONGOING PROGRAM	FARMER IDENTIFIED IMPROVEMENTS	POTENTIAL IRRIGATION IMPROVEMENTS	RECOMMENDED PLAN
<u>Economic Development</u>				
<u>Average Annual Benefits</u>				
Onfarm	\$1,717,000	\$5,230,600	\$ 5,996,400	\$4,901,700
Downstream	1,036,800	3,562,700	4,562,600	3,759,700
Employment	159,300	966,100	1,060,800	917,200
<u>Total</u>	<u>\$2,913,100</u>	<u>\$9,759,400</u>	<u>\$11,619,800</u>	<u>\$9,578,600</u>
<u>Average Annual Cost</u>				
	<u>1,095,100</u>	<u>6,700,600</u>	<u>7,497,000</u>	<u>6,394,100</u>
Net Beneficial Effect	\$1,818,000	\$3,058,800	\$ 4,122,800	\$3,184,500
Employment Benefits	12.6 work-yrs	75.4 work-yrs	79.7 work-yrs	68.6 work-yrs
<u>Environmental Quality</u>				
<u>A. Areas of Natural Beauty</u>				
Onfarm earthen ditch and associated vegetation eliminated.	257 miles	1,680 miles	1,760 miles	1,540 miles
Addition of sprinkler systems that are highly visible during operation.	19,700 acres	65,000 acres	107,500 acres	79,400 acres
Annual increase in streamflow.	5,600 acre-ft.	9,900 acre-ft.	19,100 acre-ft.	20,200 acre-ft.
<u>B. Quality considerations of water, land, and air resources.</u>				
Irrigated area	205,000 acres	205,000 acres	205,000 acres	205,000 acres
Net annual increase of water flowing in the river systems, from reduced diversions.	5,600 acre-ft.	9,900 acre-ft.	19,100 acre-ft.	20,200 acre-ft.
Total salt load from irrigated area	156,000 tons	94,300 tons	78,300 tons	100,000 tons
Annual reduction of salt to the river system.	21,000 tons	82,900 tons	98,900 tons	76,600 tons
Annual reduction of salt at Imperial Dam.	2.8 ppm	9.8 ppm	12.5 ppm	10.3 ppm

(Revised September 1980)

UINTAH BASIN UNIT

Summary Comparison of Alternatives (Cont.)

ACCOUNT	CONTINUATION OF ONGOING PROGRAM	FARMER IDENTIFIED IMPROVEMENTS	POTENTIAL IRRIGATION IMPROVEMENTS	RECOMMENDED PLAN
C. Biologic Resources and Selected Ecosystems				
Upland wildlife habitat disturbed during construction	320 acres	2,030 acres	2,130 acres	1,870 acres (acre-value of 630)
Riparian habitat converted to upland habitat.	1,765 acres	6,075 acres	7,505 acres	6,635 acres (acre-value of 3850)
Wetland habitat converted to upland habitat.	245 acres	825 acres	1,025 acres	905 acres (acre-value of 550)
Greasewood-salt cedar habitat converted to upland habitat.	1,825 acres	6,275 acres	7,755 acres	6,855 acres (acre-value of 1510)
Grass-sedge habitat converted to upland habitat.	1,455 acres	5,005 acres	6,185 acres	5,465 acres (acre-value of 1750)
D. Unique Cultural, Historical, Architectural, and Natural Resources.	No effect	No effect	No effect	No effect
E. Irreversible or irretrievable commitments.				
Annual consumption of electricl energy.	5,200 MWh	19,500 MWh	31,200 MWh	22,600 MWh
Social Well-being				
Net regional income benefits created	\$1,451,700	\$3,838,400	\$4,354,300	\$3,546,000

(Revised September 1980)

Permits

There are no known Federal permits, licenses or other entitlements required prior to implementing the proposed works of improvement. The scope of work proposed in the alternative plans presented herein is limited to implementing soil and water conservation practices needed for improving onfarm use and management of irrigation water and to improving off-farm distribution canals and laterals for that water. The work to be undertaken in natural streams and water courses will be limited to replacing existing diversion structures.

VI AGENCIES, ORGANIZATIONS, AND INDIVIDUALS SENT COPIES OF THE DRAFT EIS 1/

A. Introduction

The Notice of Availability of the Draft EIS appeared in the Federal Register on June 19, 1981, page (32073). The initial 45-day review period was over on August 4, 1981. A 15-day extension was granted to three groups which resulted in an extension of the review period until August 19, 1981. No additional comments were received after that date. The following list of persons were sent copies of the Draft EIS.

Office of Cultural Resource Preservation
Advisory Council on Historic Preservation
Washington, D.C.

Agricultural Stabilization and Conservation Service
Grand Junction, CO

Agricultural Stabilization and Conservation Service
Vernal, UT

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Forest Planner
Ashley National Forest
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Ray Smith
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Executive Director of Civil Works
Corps of Engineers
Washington, D.C.

Office of Environmental Affairs
Department of Commerce
Washington, D.C.

NEPA Affairs Division
Department of Energy
Washington, D.C.

Director, Office of Environmental Review
Environmental Protection Agency
Washington, D.C.

Steven J. Durham, Regional Administrator *
Region 8, Environmental Protection Agency
Denver, CO

1/ An asterisk indicates that the agency, group, or individual responded to Draft Environmental Impact Statement. Some responses provided by a regional or more local office, rather than the head office shown on the list.

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William D. Hurley, Director
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Department of Housing & Urban Development
Washington, D.C.

Office of Environmental Project Review *
Department of the Interior
Washington, D.C.

Office of Planning, Inventory & Environmental Coordination
Department of the Interior
Bureau of Land Management
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Mark J. Beutler
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U.S. Bureau of Reclamation
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Denver, CO

Colorado Department of Health
Division of Water Quality Control
Denver, CO

Colorado State Clearing House
Office of State Planning & Budgeting
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Colorado Division of Wildlife
Grand Junction, CO

Colorado Division of Wildlife
Montrose, CO

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J. W. Smith
Division of Oil, Gas & Mining
Salt Lake City, UT

Honorable Scott M. Matheson
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State Advisory Council on Science and Technology
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State Department of National Resources
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Robert F. Wilson
Upper Colorado River Commission
Salt Lake City, UT

Colorado Conservation Fund, Inc.
Denver, CO

Secretary-Engineer
Colorado River Water Conservation District
Glenwood Springs, CO

Colorado Farm Bureau
Denver, CO

Colorado Open Space Council
Denver, CO

Colorado Pollution Control Association
Denver, CO

Audubon Society of Western Colorado
Grand Junction, CO

Cody Jenkins
Ashley Central Canal
Vernal, UT

Dee Jenkins
Ashley Upper Canal
Vernal, UT

Dr. Clark Ballard, Director
Cooperative Extension Service
Utah State University
Logan, UT

Board of County Commissioners
Grand Junction, CO

Board of County Commissioners
Montrose, CO

Board of County Commissioners
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Jim Matsumori, President
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Sandy, UT

Ed Browning, Mayor
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Environmental Defense Fund
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Friends of the Earth
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B. Discussion and Disposition of Each Comment on the Draft EIS

Comments made during the formal interagency review of the draft environmental impact statement and their disposition are summarized below.

Department of Housing and Urban Development

Comment:

The number of permanent and temporary jobs created should be identified and explained for each alternative.

Response:

This information is displayed in Table A1-2 for the Lower Gunnison Basin Unit. In the Uintah Basin Unit employment information has been added to the socioeconomic impacts and is shown in the Social Well Being Account (Table V-7).

USDA Office of the Secretary

1. Comment:

The draft supplement does not contain a reference to the civil rights impact statement.

Response:

The following clause regarding nondiscrimination has been added to the recommended plan section for both basins presented in the draft EIS: "The Salinity Control Program will be implemented in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 CFR 15.1-15.12), which provide that no person in the United States shall, on the grounds of race, color, national origin, sex, age, physical or mental handicap be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance."

2. Comment:

Indicate how minority residents will be affected by the Salinity Control Program. Explicitly indicate whether the impact will be favorable or unfavorable. Individuals receiving tangible benefits should be racially identified.

Response:

Favorable benefits directly affecting people in the area include reduced costs of production, improved irrigation systems and increased crop yields. Other favorable benefits indirectly affecting local people include employment of otherwise unemployed or underemployed labor resources during installation; and benefits arising from production of goods afforded by the

program, or benefits arising from expenditures by the local people. Unfavorable effects of the program include reducing the need for irrigation labor. However, the reduction in irrigation employment will be offset by the need for construction employment.

Direct tangible benefits will accrue to those who voluntarily install the recommended practices for improvement. Cost-share assistance, contingent upon legislative appropriations, will be available. These tangible benefits will accrue equally to all participants on a per acre basis for the improvements installed.

Those receiving tangible benefits cannot be racially identified. (See the following Comment and Response.)

3. Comment:

Geographic location of minorities within the basin should be identified.

Response:

The Regional Planning Commission for the area, and the Mexican-American Development Council in Montrose, Colorado, report no localized settlements of any ethnic groups in the rural area. Within the towns of Delta and Montrose there are neighborhoods with high percentages of Spanish-surnamed residents but the urban areas are not directly affected by the onfarm improvement program. This conclusion is substantiated by Advance Reports of the 1980 Census of Population and Housing issued March 1981 by the U.S. Department of Commerce, Bureau of the Census.

Additional information concerning minorities has been added to the socioeconomic subsection of the Uintah Basin Unit.

4. Comment:

The Federal Government attempts to use sex-fair language in all reports. Consider for future impact statements using work-years or person-years.

Response:

The term "work-years" is now used in the document to reflect sex-fair employment opportunities.

U.S. Environmental Protection Agency

1. Comment:

There are two principal areas that concern EPA. The first involves the effectiveness of off-farm and onfarm salinity projects when viewed in light of the water rights laws in Utah and Colorado. We are concerned about whether the "saved" water from various conservation techniques can be used in accordance

with existing water rights practice and still achieve the benefits of salinity control.

Response:

Benefits of the Salinity Control Program are based on good water management for irrigated agriculture. The Soil Conservation Service will help the land user to improve the existing irrigation system and management practices being used on the land. These improvements will produce corresponding benefits.

The major salinity control benefits of the onfarm conservation measures will be to reduce deep percolation of water beyond the crop root zone. Conservation measures will only be applied on land cultivated four out of the last five years and there is no anticipated change in the cropping pattern. Onfarm salinity control efforts are not expected to bring additional land under cultivation or change land use. Their main effect is improvement in the timing and distribution of irrigation water application. This document covers the impacts of these types of actions over which USDA efforts will have some effect. As long as the water is used efficiently, the salinity benefits will be realized.

The fate of "saved" (salvaged) water will be resolved in conformance with Colorado and Utah water law which is the prerogative of the two states involved. USDA has no authority or jurisdiction to modify the water rights situation, but will make every effort to assist the private landowners with conservation measures to efficiently apply water so that salinity benefits are realized.

2. Comment:

Our second concern deals with the effectiveness of mitigation measures in trying to restore wildlife habitat that would be lost as a result of the salinity control measures. We are concerned that the voluntary program for restoring wildlife habitat as it is now constituted, may not prove to be an adequate incentive for restoring lost wetland and wildlife areas.

Response:

Changes have been made in the document to clarify the mitigation discussion. Onfarm conservation measures are being applied on those farmlands which have been cultivated four of the last five years. Wetlands are not being drained or otherwise altered to convert them to other uses.

Two practices, shallow water areas and permanent wildlife habitat improvement, are available under the Agricultural Conservation Program (ACP) and can be used to mitigate habitat losses. SCS encourages implementation of these practices. But like all other ACP practices these are installed voluntarily by individual landowners with Federal cost-share assistance.

Wildlife values are discussed with each landowner and more than half of those in the Uintah Basin with whom discussions have been held have agreed to include measures for wildlife in their long term agreements. Dollar input for wildlife is not a complete measure of benefit because management decisions such as setting aside areas from farming and adding areas left by squaring up fields do not add additional cost. Also, wildlife measures are usually planned for later in the long term agreement so the first two years of implementation are not an accurate measure of how much mitigation of wildlife habitat losses will be realized.

The USDA has no specific authority other than to encourage voluntary participation to implement mitigation measures, and the Colorado River Basin Salinity Control Act, P.L. 93-320, does not provide any new authority. USDA advocates retention of important wetlands and seeks to insure that such lands are not irreversibly converted to other uses unless other national interests override the importance of preservation or otherwise outweigh the environmental benefits derived from their protection [SCS rules for Compliance with NEPA, 7 CFR Part 650, paragraph 650.3 (b)(9); Federal Register Vol. 44, No. 169, August 29, 1979, page 50580]. For nonproject activities the State Conservationist may grant exceptions on a farm by farm basis if irrigation water management (water quality and water conservation) objectives conflict with wetland protection. SCS will evaluate economic, environmental, and other pertinent factors in such proposed actions [7 CFR Part 650.26(c)(3)(ii), Federal Register Vol. 44, No. 147, July 30, 1979, p. 44467, as corrected by Federal Register Vol. 44, No. 186, September 24, 1979].

Where basin data were available an analysis of wetland impacts and mitigation cost was made and shown in the EIS. Available funding options include:

- a. Authorizing funding for full mitigation.
- b. Authorizing funding for partial mitigation.
- c. Not authorizing funding for mitigation.

In the event that mitigation is not achieved, the evaluations show the estimated value of habitat losses expected as a result of implementing the onfarm Salinity Control Program.

3. Comment:

We also note that the relationship between U.S. Bureau of Reclamation efforts and the present USDA efforts on salinity control activities in these basins needs to be clarified and coordinated.

Response:

The SCS and the USBR have entered into a memorandum of understanding that stipulates how efforts of the two agencies will be coordinated in planning and implementing the Salinity Control

Program. Interagency coordinating committees, and interagency-interdisciplinary planning teams have been organized to assure program coordination. Generally the responsibility for providing technical assistance to install the onfarm program on private land is the function of the USDA while responsibility for improving the water delivery system serving two or more landowners is the function of the USDI. Authority for implementing the separate aspects of the program has not come concurrently, therefore, the two agencies have mutually agreed that USDA would plan and seek funding for implementing a portion of the off-farm water delivery system to assure that onfarm improvements are integrated with that portion of the off-farm delivery system serving a localized group of a few landowners.

Appropriate changes have been made in the text to further clarify the relationship between the Bureau of Reclamation and USDA agencies.

4. Comment:

Based on the EPA system for evaluating environmental impact statements under our review, we have rated this EIS as ER-2. This means we have some environmental reservations and that the above mentioned issues need further evaluation and resolution.

Response:

We acknowledge the rating received and have made changes to clarify and resolve the issues. However, USDA is unable to resolve water rights issues over which it has no control. In addition, because USDA has no specific authority for nonproject mitigation, other than to encourage voluntary participation, the document may not resolve EPA's concern about the lack of sufficient incentive for the voluntary mitigation of wetland habitat. However, we hope that EPA keeps in perspective that the proposed Salinity Control Program implementation presents an inherent conflict between environmental values (improved water quality and water conservation versus wetland loss). Therefore, it may not be possible to resolve which of the environmental values is most important and at what level of mitigation the environmental value losses are acceptable.

5. Comment:

Actions Under Consideration in this EIS. The proposed actions and timing in this EIS need clarification. Although this EIS is regarded as a cooperative effort (p. i) with the U.S. Bureau of Reclamation (previously Water & Resources Power Services), the proposals are largely USDA efforts. On page ii it is noted that "the off-farm mitigation plan to protect wildlife habitat associated with improvements to canals and laterals . . . is yet to be developed by USBR for the Lower Gunnison and Uintah Basin Units."

Further, on page IV-2, the table shows off-farm costs on six of eight alternatives. The explanatory footnote there suggests "a

limited amount of off-farm ditch lining . . . to assure proper operation of onfarm improvement." Thus it appears that not all off-farm proposals and costs are included in this document. Again it is not clear whether these off-farm improvements would be funded by USDA or USBR.

EPA has received communications from the U.S. Bureau of Reclamation in May and June 1980 indicating that they are considering a wide range of off-farm concrete lining alternatives that may range in cost to as high as 100 to 200 million dollars in capital expenditures. We think it is important to identify the full proposals of both agencies and their costs for these two salinity units; overall considerations of cost/benefit and cost-effectiveness as well as environmental impact should be done for the entire project. We would appreciate your clarifying the reasoning behind the separate agency approach that has been taken with this EIS.

Response:

Appropriate changes have been made in the text to help clarify this issue. We agree that ideally it would be better to implement onfarm and off-farm improvements at the same time. However, USBR is not yet ready to proceed with their implementation program. Therefore, USDA has chosen to proceed with the implementation of onfarm measures to comply with the salinity control act and to reduce salinity in the river. All practicable efforts are being made to coordinate the onfarm measures with future off-farm measures so they will compliment each other. We believe this can and is being done. In addition, we point out that the two agencies did coordinate and present overall considerations for salinity control work and impacts in the Colorado River Water Quality Improvement Program Environmental Statement, May 1977. Using an appropriate tiered EIS approach, USDA now presents this EIS supplement for the cumulative effects of USDA activities for two of the basins discussed in that document.

6. Comment:

Alternatives Analysis. Little attention and analysis was given to the alternative of selective withdrawal of irrigable lands having high salt-generating characteristics in the Lower Gunnison Basin Unit. Categorical retirement of 1,200 acres irrigated land in the valley was of course suggested by the USBR at a public meeting and was eliminated from further consideration because of opposition by the local people. We could understand why there would be local opposition to an alternative that would eliminate the principal industry in the valley. What EPA suggested in its scoping letter of June 16, 1980, on the Lower Gunnison Salinity Unit was the more modest proposal to consider land withdrawal on a selective basis. This alternative was in fact considered for the Uintah Basin Unit. We ask that you explain why such an alternative was also not considered for the Lower Gunnison area.

We believe that technical and water rights considerations play an important part in determining if selective land withdrawal makes any sense economically. We would inquire whether geologic and soils conditions in the Lower Gunnison Basin valleys are such that certain definable subareas (near outcrops of Mancos Shale, for example) contribute significantly more salt than the rest of the irrigated lands. If so, have ground water characteristics been measured over time and with sufficient sampling, to be able to pinpoint the highly saline areas? Do the data show any obvious patterns of salt concentration? Until such a technical analysis is done, it is difficult to recommend for or against the cost-effectiveness of a selective land withdrawal alternative solution. The alternative should not be dismissed out of hand, at this point in time.

The analysis of selective land withdrawal in the Uintah Basin Unit shows that local opposition need not arise with selective land withdrawal. The issue of what happens with the water made available from the retired lands appears to be the critical determinant of local opposition or support. The EIS should have included an analysis of Utah's and Colorado's differing water rights systems and how they affect and are affected by the question of selective land withdrawal.

Response:

Selective land retirement is considered as a modifying option for each alternative plan. Additional information has been added to the Lower Gunnison Basin alternatives section concerning selective land retirement. This type of retirement is considered as a modifying option for each alternative plan, but specific areas to be retired have not been determined. Site specific recommendations for land retirement will be considered during detailed planning for implementation, when actual cost of improvement can be compared with current land values and onfarm benefits.

It is true that an evaluation of geology and soil conditions are important in deciding definable subareas for implementation. That is one of the reasons SCS used a watershed approach in presenting potential treatment effects on salinity reductions in the Lower Gunnison Basin. In addition, Figure IV-2 was presented to reflect areas where Mancos shale and younger alluvial deposits may contribute to the salt load. This information will be supplemented with site specific data during detailed planning for implementation to further isolate those treatment areas where a decrease in deep seepage would significantly contribute toward decreased contribution to the higher saline aquifers. This geologic and soils information will help USDA decide on the onsite benefits in a particular treatment area, but this input will not change water rights. As indicated in response to EPA comment No. 1, water rights are the prerogative of the states. Neither the degree of soil salinity nor the contributions in any given area to saline aquifers by deep seepage are criteria for water rights allocation. Therefore,

we do not plan to do an indepth analysis of water rights because: (1) USDA has no authority or jurisdiction to change water rights to areas with greater or lesser salinity contribution; (2) implementation is based on a voluntary commitment to enter into a long term agreement so the area to be specifically treated will not be known until detailed planning for implementation; and (3) the degree of salt contribution from any given area is not criteria for the states in determining water rights.

In other words, an indepth analysis of the water rights would still not provide us with impact effects in any site specific area and to project such effects would be a crystal ball type exercise with no validity.

7. Comment:

State Water Law and Salinity Program Effectiveness. Very little discussion has been presented on Utah and Colorado water rights law as each affects the overall salinity control efforts in the two Units. We think such a discussion is necessary to ensure that the principal benefits of this program (namely salinity reductions) do in fact take place as planned. Most of our comments are in the nature of an inquiry; we are aware of some of the water rights aspects and pose what we take to be possibly important questions that have not been addressed in the draft EIS.

Uintah Basin--As we understand the situation, the State Engineer under Utah's prevailing water rights system issues permits to divert a certain flow of water based on the amount of existing irrigable land. We also understand that because there are generally more irrigable acres than available water in the Uintah Basin (particularly towards the end of the irrigation season), that some of these lands are not irrigated (either they are dryfarmed or allowed to lie fallow) in any given year.

If the salinity control measures result in a significant water consumption or application savings, wouldn't this "saved" water then be redistributed to those fallow or dryland irrigable acres by their owners? Wouldn't this then have the potential effect of increasing the total amount of land actually irrigated, increasing the amount of leached salts, and negating somewhat the effects of the overall salinity reduction?

Under the same assumptions as mentioned above, how would the situation work with selective lands withdrawal? The EIS indicates on page V-7 that "the water right for the retired land would be forfeited." Has the State Engineer already made this determination? What would happen to the "forfeited" water? Would it have to be left instream and flow out of the basin until new irrigable land was developed?

The EIS suggests on page V-27 that the "saved" water from the recommended plan will accrue to various streams feeding the

Duchesne River. EPA supports the concept of maintaining minimum flows instream for aquatic benefits; we must ask, however, whether this will in fact occur under the Utah water rights system.

Lower Gunnison Unit--Our understanding of Colorado water rights law is that this system differs considerably from Utah's. In Colorado, a water right is treated generally as a transferable property provided that no injury to junior users occurs. We would like to know about the eventual use of the "saved" or conserved water from the salinity control activities.

The EIS did not provide any details on the water budget for the various Lower Gunnison Unit alternatives as was done for the Uintah Basin evaluation. The SCS document "Potential for Onfarm Irrigation Improvements--Lower Gunnison Basin Unit Salinity Control Study" however, provides essentially the same water budget information. This report indicates that implementation of the preferred plan could reduce the annual amount of water now diverted to Lower Gunnison Basin irrigation by 545,000 acre-feet annually. The report also indicates that deep percolation and return flows could decrease from the present by 356,000 acre-feet per year. The consumptive use of the water in the preferred plan would increase perhaps by some 67,000 acre-feet over the present, measured as a change in the net application to the land.

There are thus potentially major shifts in historical diversions, consumption, and use patterns that would occur as a result of these salinity control measures. Individual diverters will be drastically reducing their intakes. More water will be available at certain downstream points. This raises the question as to how the State priority system will adjust to these changes. Are there likely to be many challenges to these historical changes in water use patterns?

In the South Platte basin, any change in the historical amounts of seepage and use are resisted legally because of the presence of many alluvial well users. Are there any similar well users in the project area who may be affected?

There also appears to be a modest increase in the consumptive use of the applied water over the present. Will this be a problem in view of Colorado's doctrine of limiting changes to historical consumptive patterns? Will there be any need to provide makeup water for this added consumption? Does the projected decrease in water available to phreatophytes (in wetland areas, in surface drainage areas) compensate for this increased onfarm consumption? Finally, what is the likelihood, if any, of farmers opening up new irrigable land in the Lower Gunnison area, given the additional amounts of water which may be at least temporarily available at upstream locations?

It may well be the case that these water rights issues have already been addressed, but our review and knowledge is limited

to the EIS and other information mentioned in this review. From our experience, any water quality activities affecting quantity must be carefully integrated with prevailing water rights law to be successful.

Response:

EPA has done an excellent evaluation of the water rights problem. The specific issues raised are concerns with the effect that changes in deep percolation, return flows, and consumptive use will have on potential shifts in historical: (1) diversions; (2) consumption; and (3) use patterns. Please refer to our responses to EPA comments No. 1 and 6, to why we do not feel that it is appropriate to do an indepth basinwide analysis and presentation of water rights or how the state priority system will allocate the "saved water" in the two states.

In addition, some changes have been made in the document to clarify the discussions of water rights effects.

8. Comment:

Wildlife Mitigation Efforts. Wildlife habitat mitigation for wetland losses is well integrated into the presentation of alternatives in this EIS document. Considerable work has gone into predicting different levels of habitat loss under alternative assumptions. EPA's principal concern is with how the mitigation will take place.

On pages IV-23 to IV-25, three mitigation strategies are presented. The first alternative is cost-shared voluntary mitigation only, which is said to be the most likely mitigation strategy. A second mitigation strategy mentioned would be for Congress to authorize and fund wetland mitigation by the USDA at the time it approves funding for the Lower Gunnison Unit. The third alternative suggests that Congressional funding could be provided at the time when the U.S. Bureau of Reclamation proposed wildlife mitigation for its part of the projects.

EPA is concerned that the first mitigation alternative may not contain much of an incentive to accomplish the goal of wildlife habitat mitigation. Cost-share limits are low relative to the cost of irrigation improvements for any given operator. This forces the farmer to choose between using scarce federal dollars for irrigation improvement work (which should yield financial returns) or for wildlife mitigation (with minimal financial returns). Given that kind of choice, the use of cost-share funds for wildlife may be rare. One possible way to avoid this dilemma would be to have a separate cost-share account for wildlife habitat improvement that is available over and above the cost-sharing for other work. Such an approach would require changes in past USDA policy.

It is also possible that the funding for wildlife habitat could be integrated with the U.S. Bureau of Reclamation's efforts.

In view of our earlier comments that close coordination of both agencies' efforts should be made to identify and develop an integrated salinity project for each basin, perhaps the EIS should be deferred until the USBR is ready to proceed with its program for salinity control and wildlife mitigation.

EPA also wishes to point out that not all land is equally valuable as wildlife habitat. It may be more cost-effective to pay 100% mitigation costs in carefully selected areas than to pay a 75% share on scattered plots (farmer choice) that may be of limited usefulness to wildlife. While there is some opportunity to substitute upland habitat for wetland, improvement of key riparian wetlands is an important component of mitigation that may not necessarily appeal to individual farmers.

Phased development which involves taking the most saline areas first, is a positive approach from both an environmental and economic standpoint. Evaluations on a periodic basis, such as the five years suggested here, are certainly needed. These evaluations should include not only the effectiveness of best management practices, farmer acceptance, and effectiveness of salinity control, but also assurances that wildlife mitigation is keeping pace with overall project implementation.

Response:

USDA is well aware of EPA's concern about how much habitat mitigation will take place. As indicated in our response to EPA comment No. 2, changes have been made in the document to clarify the mitigation discussion. We have only indications so far as to how much voluntary mitigation might take place as a result of our accelerated technical assistance. However, we see considerable interest in the Uintah Basin. For example, wildlife values are discussed with each landowner during detailed planning for implementation, and more than half of those in the Uintah Basin with whom discussions have been held, have agreed to include measures for wildlife in their long term agreements.

The option of setting aside funds for wildlife habitat measures on individual farms has been tried. The State ASCS Committee in Colorado has used (1980) a statewide fund for wildlife practices which was provided to the county committees as a fund allotment above the cost-shares for other work.

We are aware that all land is not equally valuable for habitat, and admit that it would be very desirable to apply 100% mitigation cost in carefully selected blocks of land rather than on individual farms. As indicated in the mitigation discussion in the document and in response to EPA comment No. 2, this option would require additional authority for ASCS to be able to handle the cost-share provisions, operation and maintenance, and water rights.

We plan to use a phased development approach with a follow-up evaluation of environmental and economic effects. This overall monitoring strategy is being developed with broad based input

and will include effectiveness of practices, farmer acceptance, effectiveness of salinity control, wildlife losses, and mitigation.

As indicated in response to EPA comment No. 3, USDA does plan to proceed with finalizing this EIS and with implementation. The U.S. Bureau of Reclamation will proceed with its program for salinity control and wildlife mitigation as it completes planning on various units. That is not expected to happen in the Lower Gunnison and Uintah Basin Units for some time.

U.S. Army, Corps of Engineers

1. Comment:

We have reviewed the draft supplement and have concluded that the onfarm and selected lateral work anticipated under USDA programs will not conflict with nor adversely affect flood control, navigation, or other jurisdictional responsibilities of the Corps of Engineers.

Response: Noted.

2. Comment:

Where the proposed work would involve a discharge of dredged or fill material into upland irrigation systems or wetlands which have been created by past irrigation practices, the work would be exempted from regulation under Section 404 of the Clean Water Act (33 USC 1344). In the event that some of the work involves a discharge of dredged or fill material into natural stream channels which are used for irrigation or irrigation return flows, the work would come under the purview of Section 404. If, in your future planning, it becomes apparent that discharges subject to Section 404 will occur, we suggest that you contact us well enough in advance to allow for the processing of a Department of the Army permit application.

Response:

It is not anticipated that the proposed work would involve discharge of dredged or fill material into natural stream channels.

U.S. Forest Service

Comment:

That portion of the supplement dealing with the Uintah Basin Unit relates to areas adjacent to the Ashley National Forest. However, we see no effects or impacts on National Forest lands or management practices from actions proposed by the supplement. Therefore, our input for the supplement can be summarized as "no comment."

Response: Noted.

U.S. Department of Interior

1. Comment:

We believe the document is deficient in fully disclosing and analyzing environmental consequences of the salinity control actions for the following reasons.

The discussion of the environmental consequences for each unit is incomplete. CEQ regulations require a presentation of the impacts for each alternative in enough detail to form the scientific and analytic basis for the comparison of alternatives. Many of the major impacts mentioned in the discussion of alternatives (e.g., wetland habitat losses) are not discussed in this section at all (Lower Gunnison Basin) or are discussed generally without any comparison of the different impacts of the various alternatives (Uintah Basin).

Response:

Appropriate changes have been made in the text and in the tables to further clarify the comparison of environmental consequences for the various alternatives. Specifically, the following information has been added to the Lower Gunnison Basin section of the document.

The Environmental Subteam of the Interagency Multiple-Objective Planning Team indicated the significant adverse environmental impact resulting from implementation of conservation measures to control salinity would occur on wetland habitat. It is also recognized that salinity control, i.e., water quality improvement, will be a beneficial environmental impact of the salinity control effort.

A new table (Table IV-9) indicates the calculated loss of wetlands and the estimated salt reduction, by alternative. These environmental consequences are more fully discussed in Chapter IV-B for each alternative.

In the interest of brevity most of the environmental consequences of alternative plans are displayed in Tables A1-1 through A1-4 for the Lower Gunnison Basin Unit and in Tables V-5 through V-9 for the Uintah Basin Unit. We feel that the discussion and associated tables in the alternative and environmental consequences subsections adequately disclose and analyze environmental consequences of salinity control actions.

TABLE IV-9 - ANTICIPATED WETLAND HABITAT LOSSES AND SALT REDUCTION
BY ALTERNATIVE, LOWER GUNNISON SALINITY CONTROL STUDY

Alternative	Wetland Losses (ac)	Salt Reduction (1000 tons)	Acres of Wetland Lost/ 1000 tons Salt Reduction
1	370	10	37
2	750	35	21
3	1,300	140	9
4	400	205	2
5	3,100	235	13
6	5,900	340	17
7	3,800	320	12
8	13,200	420	31

2. Comment:

The Department's Fish and Wildlife Service provided written scoping comments to the State Conservationist on October 1, 1980. Several items raised in that letter have not been adequately addressed in the draft supplement. These include: (1) impacts of instream flow changes and water quality changes on fish and wildlife habitats and downstream water rights; (2) use of the Agriculture Conservation Program (ACP) to achieve salinity control; (3) the overlap between ACP efforts and SCS watershed planning in the Uintah Basin; and (4) coordination between USDA and our Bureau of Reclamation's (BR) salinity control efforts in the two basins.

Response:

Instream flow changes are an indirect result of more efficient use of irrigation water. Onfarm conservation measures are aimed at reducing deep percolation losses and thereby reducing salinity picked up by these waters as they return to the streams.

Impacts of instream flow changes and water quality changes on fish and wildlife habitat were not addressed in the draft statements. If water is "saved" through a reduction in withdrawals for irrigation, it is not within the purview of the Soil Conservation Service to command that such "saved" water be left in the stream to increase instream flows. Water saved by increased

efficiencies will be dealt with under state law and according to state water allocations. USDA agencies can only act within their authorities. See response to EPA comments No. 1, 6, and 7.

Studies were not made to determine the impact of water quality changes on fish and wildlife habitat. If studies had been made, to what would we have compared the impact of estimated changes? To our knowledge there is a paucity of research indicating finite knowledge pertaining to changes in salinity (TDS) levels as they may affect fish and wildlife. This apparently is true for even the threatened and endangered species.

The Colorado River Salinity Control Act, P.L. 93-320, directed the USDA to plan and implement the onfarm salinity control program for the Grand Valley Unit using authorities available to the USDA.

The USDA Agricultural Conservation Program (ACP) achieves salinity control only by stimulating irrigators to install necessary measuring devices, control facilities, and associated conservation measures to help them do a more efficient job of applying the necessary water to their crops. The other aspect of onfarm water conservation is for SCS to educate farmers and to provide them with guidance on when to apply water. With this guidance they could apply water when it is needed for the consumptive use of the crop. The ACP applies only to the conservation measures needed by individual farmers. A P.L. 566 watershed project provides accelerated technical and associated financial assistance with the group owned segments of the water distribution system. The two programs are fully compatible and complementary and do not duplicate each other.

Funding to implement the Salinity Control Program is controlled by the Congress as was illustrated when funding to implement the Grand Valley Unit was authorized through the Agricultural Conservation Program. Subsequent funding to implement the Uintah Basin Unit also was authorized through that same program.

The relationship between the SCS and USBR is outlined in the Forward and in the subsection discussion of coordination with other agencies. The text has also been modified to further clarify the coordination.

The SCS and the USBR have entered into a memorandum of understanding that stipulates how efforts of the two agencies will be coordinated in planning and implementing the Salinity Control Program. Interagency coordinating committees, and interagency-interdisciplinary planning teams have been organized to assure program coordination. Generally the responsibility for assisting the onfarm program on private land is the function of the USDA while responsibility for improving the water delivery system serving two or more landowners is the function of the USDI. Authority for implementing these separate aspects of the program

has not come concurrently, therefore, the two agencies have mutually agreed that USDA would plan and seek funding to implement a portion of the off-farm water delivery system to assure that onfarm improvements are integrated with that portion of the off-farm delivery system serving a localized group of a few landowners. See also the responses to EPA comments No. 3 and 5.

Appropriate changes have been made in the text to further clarify the four issues raised in this comment.

3. Comment:

The no action alternative for the Uintah Basin appears to be discussed under "continuation of ongoing programs." The ongoing program in the Uintah Basin includes measures being implemented under ACP. It is our understanding that the supplement is after-the-fact to what has been occurring in the Uintah Basin for the last two years. The statement should acknowledge this, and an alternative which considers no Federal participation should be included.

Response:

We disagree that the supplement is after-the-fact. The reason for this supplement is to address the cumulative effects of implementation of the salinity control practices for which SCS is providing technical assistance on individual farms. In addition, the implementation of salinity control measures under ACP is covered in the Final Environmental Impact Statement for the Colorado River Water Quality Improvement Program that was published in May of 1977. The no action alternative is the same as the "continuation of ongoing programs." The money available under ACP has been accelerated in the past two years by the ASCS who targeted funds to the Uintah Basin to help reduce salinity. An alternative showing no federal participation is not viable because it is in conflict with the Treaty which prompted the Salinity Control Program.

4. Comment:

The SCS, on April 14, 1980, requested a list of endangered species that might occur in the Lower Gunnison project area, and this was provided by our FWS. However, the SCS never prepared a biological assessment addressing the possible impacts of the project on these listed species. A biological assessment is needed because the proposed action is a "construction project," and NEPA compliance is being satisfied by preparation of an EIS. The FWS does not believe that one sentence in the draft statement, "none of the listed species appear to be affected by the proposed action," is an adequate biological assessment. Endangered species consultation with our FWS should be completed for the Lower Gunnison Basin Unit, and the results presented in the EIS.

Response:

The Lower Gunnison Basin Biological Assessment was transmitted to U.S. Fish and Wildlife Service on December 14 in accordance with Section 7(c) of Public Law 95-632. In a letter dated February 5, 1982, the U.S. Fish and Wildlife Service concurs with the assessment that none of the listed species will be adversely affected by the Salinity Control Program. A Section 7(c) nonjeopardy opinion was received from U.S. Fish and Wildlife Service on April 9, 1981, for the Uintah Basin.

5. Comment:

There are many inconsistencies in the document when discussing wetlands. Acreage figures vary considerably and the totals do not compare in different sections of the document for the same project area. Terms such as "habitat units," "acre values," and "maximum implementation" are not defined nor is the source of this information referenced. In contrast, some important sources of information appear to have been overlooked.

The SCS has prepared two reports dealing with wetlands in the two project areas--"Lower Gunnison River Basin Wetland Inventory and Evaluation," in 1979, and the "Uintah Basin Wetlands - Land Use Study," 1980. Wetland information in the supplement is not consistent with information in these reports. These two important sources of information should have been used in the preparation of this draft supplement.

Response:

The text has been modified where appropriate to eliminate the inconsistencies in numbers and words. One new wetland table has been added to the Lower Gunnison section. Terms are defined in the Glossary and pertinent sources of information are listed in the Bibliography. New data are being developed all the time. Available information was considered at the time the draft was prepared. New data such as the revised wetland mapping in the Uintah Basin were compared to the original wetland data. The original wetland mapping still proved to be valid with the new data basically only providing more detail. The Lower Gunnison report material was the basis for the Lower Gunnison wetland evaluation presented. Also see response to USDI comment No. 13.

6. Comment:

We strongly disagree with the discussions of mitigation and conflicts between wetlands protection and salinity control as it is presented for both project areas. We agree that wetland habitats will be adversely impacted by salinity control measures, but disagree that mitigation of these losses would be in conflict with salinity control efforts.

As pointed out in the draft, SCS has authority and responsibility for mitigation of wetland losses under its own NEPA regulations, Executive Order 11990 (Wetlands Protection), and USDA policy. This, coupled with the interagency cooperation mandated by Title II of the Salinity Control Act appears to make a strong case for developing effective mitigation features in each basin and relating them directly to each salinity control action.

Ignoring, postponing, or relying on voluntary, cost-share programs alone for mitigation needs will not accomplish the coordination of Federal efforts as called for in Title II. We believe that available USDA programs can be used to effect a more timely and parallel approach to the problem of wetland loss. Salinity control actions and their appropriate mitigation features should be planned and implemented concurrently. The draft supplement fails to analyze the expected impacts from this coordinated viewpoint, and we recommend that this be done in the final supplement.

Response:

Salinity control efforts will utilize certain conservation measures that are designed to prevent or reduce deep percolation of water. We believe there is a probable conflict between efforts to control deep percolation on a given farm and development of wetlands in the same area that would require flooding to maintain because these wetlands would themselves become a source of deep percolation.

Admittedly, wetlands for mitigation could be constructed in areas where deep percolation would not pick up salts or where salts do not occur. Such areas would have to be located on low salt-producing areas, or adjacent to major streams where salt loading due to percolation would be minimal.

If the Lower Gunnison salinity control effort is funded as the Grand Valley and Uintah Basin areas have been, through the Agricultural Conservation Program, mitigation would have to be dealt with farm-by-farm. In this event 1) mitigation would have to be done on the farm where wetland losses occur, 2) mitigation would be voluntary, and 3) suitable sites for wetland mitigation would have to be available.

Essentially, it would do little good to control deep percolation on a given farm only to develop another area (a wetland) on the farm that would promote deep percolation. We do not mean to imply that salinity control precludes mitigation: it does govern where mitigation areas could be located if funding is available.

SCS does have responsibilities for wetland preservation and protection as pointed out. Our studies have attempted to indicate the magnitude of wetland losses that can be expected for each alternative so this information can be used by the decisionmakers.

Two practices, shallow water areas and permanent wildlife habitat improvement, are available under the Agricultural Conservation Program (ACP) and can be used to mitigate habitat losses. SCS encourages implementation of these practices where feasible. But like all other ACP practices these are installed voluntarily by individual landowners with Federal cost-share assistance.

SCS advocates retention of important wetlands and seeks to insure that such lands are not irreversibly converted to other uses unless other national interests override the importance of preservation or otherwise outweigh the environmental benefits derived from their protection [SCS rules for Compliance with NEPA, 7 CFR Part 650, paragraph 650.3 (b)(9); Federal Register Vol. 44, No. 169, August 29, 1979, page 50580]. For nonproject activities the State Conservationist may grant exceptions on a farm by farm basis if irrigation water management (water quality and water conservation) objectives conflict with wetland protection. SCS will evaluate economic, environmental, and other pertinent factors in such proposed actions [7 CFR Part 650.26(c)(3)(ii), Federal Register Vol. 44, No. 147, July 30, 1979, p. 44467, as corrected by Federal Register Vol. 44, No. 186, September 24, 1979].

The draft supplemental EIS shows the results of evaluation for further consideration by the U.S. Congress. Available funding options include:

- a. Authorizing funding for full mitigation.
- b. Authorizing funding for partial mitigation.
- c. Not authorizing funding for mitigation.

In the event that mitigation is not authorized, the evaluations show the estimated value of habitat losses expected as a result of implementing the onfarm Salinity Control Program. Since both water quality and wetlands are items of environmental concern in NEPA, a trade off between improved water quality and wetland losses may be the only remaining solution for mitigation. Some aspects of mitigation, especially avoidance, have been used by the selection of alternative 7 (3,800 acres of wetlands lost) over alternative 8 (13,200 acres lost) in the Lower Gunnison Basin.

In addition, conservation measures are only being applied on those lands which have been cultivated four of the last five years. Some of these areas fit the Circular 39 definition of wetlands but they are not natural wetlands. They have been created by over irrigation and if adjacent lands are properly irrigated these wetlands will return to their former nonhydric condition. Wetlands are not being drained or altered to convert them to other uses. The cumulative impacts of improving irrigation efficiencies of the water supply of these irrigation induced wetlands is the reason for this supplement to the Final EIS for Colorado River Water Quality Improvement Program. Under the present authority of USDA the voluntary mitigation outlined is

the only viable means immediately available. USDA can only act within its statutory authorities to coordinate its Federal efforts called for in Title II of the Salinity Control Act. However, USDA is trying to expand this authority. See response to EPA comments No. 2 and 8 and the response to Utah Division of Wildlife Resources comment No. 1.

The amount of wildlife habitat mitigation accomplished to date under the voluntary mitigation appears low. This is because most of the wildlife measures planned in the long term agreements are scheduled for the end of the installation period.

Money spent on wildlife practices is not a complete measure of the amount of habitat improved, created, or mitigated. In many cases, the management techniques employed create habitat with no expenditure of funds. In other cases, a small section of fence or some seeding for food and cover can be extremely beneficial to wildlife.

7. Comment:

The document indicates that the most likely plan will involve the use of the ACP which is the present course of action in the Grand Valley and the Uintah Basin. It is also shown that the ultimate level and type of mitigation will depend upon: (1) the final USDA program (currently ACP); (2) possible Congressional approval of a project area mitigation program; and (3) the off-farm mitigation program of our BR. It is not clear whether or not these concepts (page ii) have been considered as alternatives or incorporated into any of the alternatives. We recommend that the supplement clarify this and present an enlarged analysis, particularly on item (2).

Response:

Appropriate changes have been made in the text to clarify the mitigation issue. Because all of the land involved in the on-farm salinity control effort is privately owned, the mitigation of wildlife habitat losses is voluntary whether funded by the farmer, with ACP money, or by special appropriation of Congress. Wildlife values are discussed with each landowner during development of his long term agreement. If the federal government exerts too much pressure on farmers to favor programs that are counter productive to their economic situation both the salinity control and wildlife habitat purposes will suffer. Unless Congress provides some viable economic incentives to farmers, the present voluntary program for wildlife habitat and salinity control, based on 75 percent cost-sharing on long term agreements, is the only one that will work and is therefore shown as the most likely scenario. See also responses to EPA comments No. 2 and 8.

8. Comment:

Our field experience with the ongoing program and our review of the supplement leads us to believe that wetland impacts will be

severe because ACP is a voluntary program and is difficult to coordinate concurrently with salinity control measures. BR off-farm programs are well behind USDA efforts in these basins. Planning and environmental compliance documents are at least a year away from completion. FWS and BR are coordinating impact assessment and mitigation activities for the off-farm program, but this does not include any mitigation needs for the USDA onfarm program.

In summary, we recommend that the final supplement discuss and analyze the concept of concurrent planning and implementation of salinity control actions and mitigation. To this end, we suggest that one possible solution is to condition ACP so that cost-share funds are proportionally awarded for salinity control and mitigation measures.

Response:

The Soil Conservation Service has no control over the timing of the Bureau of Reclamation program nor the use of ACP funds administered by the ASCS. The purpose of this supplement is to present the cumulative impacts of the technical assistance we are providing to farmers. ASCS has used the techniques of withholding ACP funds for wildlife practices (see response to EPA comment No. 8), but their authority contains no provision for proportionally awarding funds for one type of measure versus another.

9. Comment:

Page ii. Although BR programs for mitigation of wetland losses are mentioned, it should be made clear that these programs would not mitigate onfarm losses.

Response:

Appropriate changes have been made in the text.

10. Comment:

Page ii, paragraph 2. The discussion of alternative levels of mitigation is extremely misleading. Under current project plans, there are no alternative levels of mitigation. The small wildlife projects planned by a few individual farmers do not really address the broad picture of mitigating for wetland habitat losses, and are totally dependent upon the farmers having funds available at the end of their long term agreements with SCS. Development and discussion of adequate mitigation plans are avoided.

Response:

We agree there are no known viable alternative mitigation plans to the voluntary program presently being used. Appropriate changes have been made in the text to further explain this fact. See also response to EPA comments No. 2 and 8.

11. Comment:

Page iii, paragraph 1. We question whether the wetland impacts of the Grand Valley Unit are being offset by voluntary conservation practices. We are not aware of coordination between USDA and our FWS in development of individual conservation plans for the Grand Valley Unit. Documentation of this coordination effort should be provided as well as the specific quantification of wetland losses that are being offset.

Response:

Coordination is taking place during the implementation work in the Uintah Basin Unit but is not occurring in a similar manner in the Grand Valley Unit. However, Grand Valley wetland impacts are not the focus of this EIS.

12. Comment:

Page iii, paragraph 2. Mitigation plans were presented (a worst-case analysis of full mitigation) for the Lower Gunnison Basin, but no mitigation plans have been presented for the Uintah Basin Unit. These plans should also be developed for the Uintah Basin Unit. Since onfarm salinity measures have been implemented under ACP, the mitigation plan could include those items implemented as mitigation in the Uintah Basin for the last two years.

Response:

An evaluation of the wetland impacts was prepared and presented for both basins. The potential mitigation scenarios are also the same for both basins. What is different is the presentation of impacts. In the Lower Gunnison Basin the amount of wetland mitigation that would be lost in a worst-case analysis and the dollar cost for replacement are shown. As indicated in previous responses, to use a dollar amount for mitigation replacement does not present a complete picture of the field situation. Probably the greatest benefit to wildlife will accrue incidentally as sprinkler systems are installed. Many fields in the basins are odd shaped and sprinkler irrigation systems are not easily fitted to these odd areas. As a result many odd areas will be left out of the system and therefore out of cultivation. Many of them will be fenced and seeded for wildlife. See also response to EPA comments No. 2 and 8 and UDFW comments No. 1, 9 and 10.

13. Comment:

Page I-1, paragraph 1. The figures presented here relating to wetland impact are inconsistent with the Lower Gunnison Wetland Inventory and Evaluation Report published by the Soil Conservation Service in 1979. According to this report there are only 8,760 acres of irrigation induced wetlands, not 14,800. The total wetland acreage in the LGBU was estimated to be 21,932, not 39,600 (14,800 + 24,800). Throughout Chapter 4, Part B, wetland

acreage figures presented for the project study area exceed 21,932 and vary from 30,000 to almost 38,000. Corrections should be made.

Response:

The cited study was made on an area deemed to be representative of the larger SCS study area (100,000 acres irrigated land versus 171,000 acres). This was concurred in by FWS and DOW representatives. Data from the Rector, et al (1979) study were extrapolated to obtain wetland acreage figures used in the draft supplemental EIS.

14. Comment:

Page II-1, paragraph 2. We do not agree with the statement that "no direct changes in land use will be made, and no new land will be brought into production." The loss of riparian habitat along existing canals, laterals, and ditch banks are direct land changes which will affect all wildlife species that use those areas. Wetland habitats will be converted to upland habitats and should be identified as such. The possibility of farmers using conserved irrigation water to bring marginal lands into production needs to be identified and discussed.

Response:

Appropriate changes have been made in the text to further clarify the types of changes that will occur. There are no expected changes in the amount of private irrigated cropland and pastureland which are the principle land uses in the area. However, there will be impacts on the wildlife uses of these lands. Specific impacts on wildlife habitat are identified in the discussion of riparian habitat wetlands and upland habitat. Conservation measures will not be implemented on lands not currently being irrigated four of the last five years. The canals and major laterals are being studied separately by the USBR. Therefore the Utah portion of this supplement does not address the effects of any changes from construction of these canals and laterals.

15. Comment:

Page II-2, paragraph 1. While wildlife mitigation features are being incorporated into some of the long term agreements with landowners, this program is totally voluntary. Also, there is no guarantee that the majority of landowners will take advantage of the program or that the wildlife features will ever be put into effect. The cooperation of the landowners is essential for any wildlife mitigation features and needs to be addressed.

Response:

We agree the mitigation program is voluntary and there is no guarantee that any landowners will take advantage of wildlife

features. The fact is that even without any economic incentive over half of the LTA's planned to date in the Uintah Basin include measures for wildlife. It is also a fact that many odd areas will be left undisturbed when fields are squared up to implement improved irrigation systems. Also, the acre value of many areas will be improved which will further mitigate other losses.

16. Comment:

Page III-2, paragraph 2. The text states, "... water management measures . . . could cause significant adverse local or cumulative impacts on the environment." The statement should state whether and explain how these impacts are going to be mitigated.

Response:

The text has been revised to clarify this point. See response to EPA comments No. 2 and 8 and response to USDI comments No. 7, 12 and 15.

17. Comment:

Inside cover letter. The term "acre value" is used here and throughout the draft supplement. However, nowhere in the text or glossary is the derivation of an acre value identified. The only explanation given is that an acre value is a comparative expression between existing habitat and optimum habitat.

Response:

We feel that appropriate discussions of the derivation of acre values are included in the text. These values were determined by the biologist in cooperation with representatives of the U.S. Fish and Wildlife Service.

18. Comment:

Page IV-3. Plan One would impact 370 acres of wetland according to the report. Discussion should indicate how this was determined, how the wetlands will be impacted, and if the wetlands are being converted to other uses. This comment applies also to discussions of wetland impacts for other plans.

Response:

The suggested discussion is in the Introduction portion of the Environmental Consequences section, page IV-43 of the Draft Supplemental EIS. That discussion has been revised in response to this comment.

The following are the assumptions and methods used to estimate wetlands acreages and habitat values as found in the draft EIS supplement.

a. Assumptions used to calculate wetland losses:

(1) The area sampled and reported on in "Lower Gunnison River Basin Wetland Inventory and Evaluation," (Rector, C.D., E.W. Mustard, and J.T. Windell. USDA-SCS. 90 pp.) is representative of the enlarged SCS study area. This has been verbally concurred in by FWS and the Colo. DOW.

(2) All wetlands, regardless of water source given in the above study, will be affected by implementation of salinity control measures.

(3) Wetlands occur uniformly in a ratio of 21.9 acres of wetland: 100 acres of irrigated land in each sub-basin.

(4) Wetland losses or alternations are inversely proportional to changes in irrigation water efficiency, i.e., gain in efficiency results in a loss of wetlands, while a loss in efficiency results in a gain in wetlands. The mean irrigation efficiency for the project area is 31 percent at present.

b. The following formula, addressing wetland habitat values based on adaptation of Golet (Golet, F.C. 1973. Classification and Evaluation of Freshwater Wetlands as Wildlife Habitat in the Glaciated Northeast. Proc. NE Fish and Wildl. Conf. 30:257-259) was used to estimate replacement acres and enhancement acres:

(1) General Expression:
Value Lost = Value Replaced
= Enhanced Avoid Area plus
developed new area (if needed)

$A_L V_1 = A_2 (V_2 - V_1) + A_A V_2$ where: A_1 = Total Area; A_L = Area Lost;
 A_2 = Avoided Area $A_1 - A_L$; A_A = New Area 0; V_1 =
Present Unit Habitat Value; V_2 = Enhanced Unit Habitat Value

(2) Because A_2 and A_A are unknowns, solve first for A_2

$$A_2 = \frac{A_L V_1}{V_2 - V_1} \text{ Letting } A_A = 0$$

$$A_A = \frac{A_L V_A - A_2 (V_2 - V_1)}{V_2}$$

Using the wetland acreage data as extrapolated there are +14,800 acres of wetlands that are either totally or partially influenced by irrigation management water. Use of the word "induced" on page I-1 will be changed to "influenced" to convey the idea that irrigation management water contributes, in some degree, to the existence of these wetlands.

Use of varying figures for wetland acreages in Chapter IV-13 occurs because there are different acreages that would be treated under the various alternatives, i.e., the actions described for Alternative 1 would be applied on 3,400 acres of irrigated land, while actions in Alternative 8 would be applied on 169,000 acres: obviously the wetland acres adversely impacted would be totally different for the various alternatives. Wetlands are not being drained to convert them to other uses. In addition, conservation measures are only being applied on those lands which have been cultivated four of the last five years.

19. Comment:

Page IV-4, paragraph 3. A statement should be made on how wetlands will be upgraded.

Response:

A footnote was added to the discussion of upgrading in plan two where it was first mentioned. It reads as follows: "Upgrading wetland habitat values could consist of acquisition and application of various management practices to raise habitat values above the present level. Such practices may include: fencing, livestock grazing control, tree/shrub planting, creation of open water, revegetation by direct seeding or natural, and possibly others as dictated by site and management needs."

20. Comment:

Page IV-6, paragraph 3. It should be clarified that off-farm laterals are the responsibility of the Bureau of Reclamation.

Response:

The Colorado River Salinity Control Act, P.L. 93-320, divides responsibilities under the Salinity Control Program between the USDA and the USDI. Ordinarily the division limits USDA activity to assisting individual or groups of landowners with installation of improvements on private farmland, while the USDI assists with improvements in the off-farm water delivery systems. However, in the Lower Gunnison Unit the Bureau of Reclamation limited its study to the Uncompahgre Project area. The off-farm lateral improvements evaluated and displayed with each of the alternative plans for onfarm improvements represent off-farm laterals outside of the Uncompahgre Project area, and, therefore, are included as part of the onfarm program for salinity control.

21. Comment:

Page IV-15. In the Lower Gunnison Basin Unit, more information would be helpful for plan comparison. In Plan 7, different watersheds would receive different implementation. It should be explained how the watersheds were selected for maximum or minimum implementation and point out the differences between the levels of implementation.

Response:

Additional introductory material has been added to the discussion of the alternative plans giving the requested explanation.

22. Comment:

Page IV-19. Under the discussion of Additional Alternatives, the statement that, "Categorical retirement of all irrigated land in the valley, first suggested by the Bureau of Reclamation at a public meeting, was eliminated from further consideration because of opposition by the local people," is incorrect. The largest acreage ever considered for retirement was 12,000 acres in contrast to the over 90,000 acres of irrigated land in the Uncompahgre Valley.

Response:

The error has been corrected.

23. Comment:

Pages IV-19 - 23. Under the recommended plan for Lower Gunnison, the report states that full mitigation for the impacted wetland would cost 44 million dollars. The report is not clear, however, on what habitat mitigation plan, if any, is actually proposed. This point should be clarified.

Response:

Under existing authority voluntary installation of mitigation practices is the proposed mitigation plan. Any other efforts for mitigation must be specifically included in legislation that authorizes and provides funds for implementing the onfarm program for salinity control. See also responses to EPA comments No. 2 and 8 and responses to USDI comments No. 7, 12 and 15.

24. Comment:

Page IV-20. One reason for making Plan 8 the recommended plan is cost effective salinity control. Information presented in Table IV-1, however, indicates that this is not the most cost efficient plan. Implementation cost is also given as a reason for selecting Plan 8, yet it is the most expensive plan. Additional information should be provided to clarify this issue.

Response:

After considering comments received from review of the Potential for Onfarm Improvements, Draft Report of the Lower Gunnison Basin Unit Salinity Control Study, the SCS decided to recommend Plan No. 7 for implementation. Plan No. 7 is more cost effective and environmentally more preferable.

25. Comment:

Page IV-22. Figure IV-3 should show the following technical work groups (work support teams): water resources, land resources, engineering, and environmental-social-economics. A public participation group was also involved.

Response:

The organizational chart has been corrected.

26. Comment:

Page IV-24. A "voluntary" wildlife program is described as the most likely scenario for wildlife mitigation. Cost-sharing should be conditioned upon farmers concurrently installing or establishing wetland and wildlife practices.

Response:

Cost-sharing for the onfarm program in the two units authorized for implementation has come through USDA's Agricultural Conservation Program. Those funds are subject to established rules, regulations and policies of the program and such modifications as are negotiable within the jurisdiction of its governing bodies. See also responses to EPA comments No. 2 and 8. and response to USDI comment No. 8.

27. Comment:

Page IV-30. The correct name for the Cimarron Project is the Bostwick Park Project.

Response:

The correction has been made.

28. Comment:

IV-32. "The salt from onfarm sources can be reduced by as much as 335,000 tons (76 percent) depending on which alternative plan is implemented." This conflicts with the figures given (370,000 tons, 84 percent) for onfarm salt loads reduction with Plan 8 (page IV-19).

Response:

The apparent conflict arises from using the word "onfarm" in the sentence on page IV-29. The discussion on page IV-32 shows 335,000 tons as the potential reduction from onfarm improvements separate from the potential 165,000 tons from improving off-farm laterals. The discussion on page IV-18 presents results expected from implementing Plan 8, and the 370,000-ton reduction is the sum of onfarm and off-farm effects of improvements installed under USDA's onfarm program. To avoid confusion the word "onfarm" has been deleted from page IV-18 and similar discussions of the other plans.

29. Comment:

Page IV-38. The procedures for evaluation and excavation of archeological sites discovered during construction are incorrect as outlined. In the event of an emergency discovery, construction should be stopped and the Secretary of the Interior should be notified through the Departmental Consulting Archeologist, Interagency Archeological Services (IAS), Washington, D.C. 20243 (202) 343-7105. IAS will then initiate investigation within 48 hours to determine any necessary data recovery. This procedure is pursuant to the Advisory Council on Historic Preservation's Regulation (36 CFR 800) and Soil Conservation Service Regulations (7 CFR 656).

Response:

Archeological sites discovered during construction will be evaluated and excavated in conformance with current SCS regulations (7 CFR 656). The discussion on page IV-38 has been appropriately revised.

30. Comment:

Page IV-41, Table IV-6. The wetland acreage figures presented in this table differ from those shown in the reference (Rector, et al.). The acreage should be corrected or the differences explained. Page IV-41, Table IV-7. According to Rector, et al. (1979), there are approximately 8,198 acres of wetlands influenced by irrigation water management, not 14,800.

Response:

Wetland acreage figure calculation methods have been previously explained. In brief, they were extrapolated from the cited report to an expanded study area. Footnote for Table IV-6 has been changed to note data were extrapolated from the cited study.

31. Comment:

Page IV-41, last paragraph. The new wetland classification published by FWS in 1979 (Cowardin, et al. 1969) should be used in place of Circular 39.

Response:

The SCS had intended by October 1, 1982, to adopt and convert to the new Wetland Classification System. However, because of unresolved problems associated with the system, inadequate training of field personnel, and lack of widespread use of the system, the SCS has now made the decision to conduct field tests in selected states and to delay adopting the new system until some unspecified time in the future.

32. Comment:

Page IV-42, last paragraph. This section does not satisfy Section 7 Consultation of the Endangered Species Act. The SCS should prepare a biological assessment addressing possible impacts of the project to the listed endangered species and submit this to the FWS.

Response:

See response to Comment No. 4.

33. Comment:

Page IV-43. The section on consequences should address the impact on groundwater quality, considering the magnitude of both the change in groundwater volume and the change in salinity increments.

Response:

The discussion of the impact on groundwater quality has been expanded to address the impact.

34. Comment:

Page IV-45. Under the description of the public participation process, it should be noted that the project area studied by BR consists of the Uncompahgre Valley, a smaller area than that studied by the SCS.

Response:

The difference in size and extent of area studied by the two agencies has been clarified in the report. It should be noted that the areal difference accounts in part for the apparent numeric inconsistencies pointed out in these comments received from the Department of the Interior.

35. Comment:

Page IV-46. The reasons for selecting Plan 8 are not clear. The only criterion used in selecting Plan 8 that does not appear to apply to Plan 7 is the desire of local landowners,

and they list Plan 7 as the second most desirable. Plan 7 is \$50 million cheaper (\$304,900,000 versus \$357,700,000 when off-farm lateral improvements and mitigation costs are added) and removes only 3 percent less of the salt load (81 percent reduction versus 84 percent reduction) delivered to the Colorado River from onfarm loading. Further, Plan 8 would result in lost habitat values (Table A1-4, page IV-59), making it environmentally less preferable.

Response:

After considering comments received from review of the Potential for Onfarm Improvements, Draft Report of the Lower Gunnison Basin Unit Salinity Control Study, the SCS decided to recommend Plan No. 7 for implementation. Plan No. 7 is more cost effective and environmentally more preferable.

36. Comment:

Page V-1, first paragraph. This paragraph should be expanded to include the fact that onfarm measures to control salinity are currently underway with over four million dollars either spent or committed at the present time. Also, the involvement of the SCS in the existing program should be addressed.

Response:

The text has been supplemented to clarify this situation. See response to No. 3.

37. Comment:

Page V-1, paragraph 2. The alternative listed here as "no action" is later classified correctly as "continuation of ongoing programs" which is not a no action plan. Construction of water management measures is continuing for the second year. The supplement needs an adequate no action alternative with which to compare the action alternatives.

Response:

See response to comment No. 3.

38. Comment:

Page V-2, paragraph 2. The alternatives (moderate level of development, potential level of development, and preferred alternative) do not match with the alternatives presented on pages V-4 through V-8.

Response:

Appropriate changes have been made in the text.

39. Comment:

Page V-3, paragraph 5, last sentence. It is not clear how reports on "impacts" will be made when data become available.

Response:

The sentence in question has been deleted.

40. Comment:

Page V-3, paragraph 6. We disagree with the statement that water storage facilities are outside the scope of this evaluation. We are aware that our BR is providing several water storage facilities in the Uintah Basin as part of the different units of the Central Utah Project. This should effect more timely water delivery and improve overall onfarm salinity control efforts.

Response:

SCS is evaluating the onfarm conservation measures in this document. Water storage facilities will be addressed by the Bureau of Reclamation. We agree that water storage facilities will improve overall onfarm salinity control efforts. However, that analysis is outside the scope of this document.

41. Comment:

Page V-5, paragraph 5. It is unclear how the additional 18,280 acres of upland habitat are going to be created. This needs to be explained here and for the "maximum potential" alternative.

Response:

The text is in error. It has been changed to show 18,180 acres of wetland with an acre value of 5,810 to upland. The sentence about creating an additional 18,290 acres of upland habitat has been deleted.

42. Comment:

Page V-7. Complete retirement of all irrigated lands was considered as an alternative in both basins, but does not appear reasonable. However, partial retirement is an alternative that may deserve greater consideration. In the Lower Gunnison Basin, it is not discussed at all and in the Uintah Basin, it is discussed only briefly. Partial land retirement combined with a program of increased efficiency could be cost effective and agreeable to the farmers since, even if they lose the water rights to the retired land, the increased efficiency should give them water for other irrigated lands or other uses.

Response:

The writeup for the alternative of partial land retirement has been expanded to further clarify the situation.

43. Comment:

Page V-8, paragraph 3. Since the preferred alternative was chosen to best fit each evaluation unit, it should be discussed on a unit-by-unit breakdown. Also, there is possible overlap in some of these units with work being planned and implemented by the SCS under the small watersheds program. This is particularly true for the Dry Gulch Unit and the Martin Lateral and Dry Gulch Watershed Projects.

Response:

The SCS chooses not to display this by evaluation units in the Uintah Basin Unit since an environmental evaluation is being done on each individual LTA and the details of effects are documented. The small watersheds program involves work on group irrigation distribution facilities where the salinity study agreements deal with individual onfarm units.

44. Comment:

Pages V-8, V-10, and V-29. Much of the area shown for sprinkler irrigation would need pumping because of the lack of gravity head. The question arises as to whether the local farmers would support the costs associated with such systems. This aspect should be clarified.

Response:

The SCS planner works closely with the individual farmer in assessing the particular situation on each individual's farm. Various types of irrigation system improvements are presented to local irrigation company officials during the development of alternatives. For those sprinkler systems needing pumps to develop pressure, cost of pumping were included in the information presented during these meetings. Five meetings were held during November 29 through December 1, 1977. These meetings were held in Duchesne, Roosevelt, LaPoint, and Vernal.

45. Comment:

Part V-11, Table V-2. The table needs to include columns for both existing conditions and a "no action" alternative.

Response:

The tables are correct as written. The "continuation of ongoing program" is the base from which project effects are measured, not the existing conditions.

46. Comment:

Pages V-12 and V-13, Mitigation. There is no explanation of the mitigation plan for the preferred alternative or other alternatives presented earlier in the report. The loss of wetland habitat (13,000 acres), assuming full implementation of the recommended plan, is a significant acreage loss of a valuable and relatively scarce habitat type within the study area. Section 2.(a)(2) of Executive Order 11990 states that "the proposed action includes all practicable measures to minimize harm to wetlands . . ." A definite proposed mitigation plan should be developed for habitat losses and should be included in the final supplement.

Response:

We agree that the wetland habitat lost is significant and valuable. We disagree that it is relatively scarce since 36,000 acres of irrigation induced wetlands remain. We believe that all practicable measures are being taken to minimize harm to wetlands. The only mitigation possible under the present statutes is being vigorously pursued. See also the response to EPA comments No. 2 and 8.

47. Comment:

Page V-12, paragraph 2. The statement is made that, ". . . wetland losses. . . are being minimized by including wildlife conservation practices in the conservation plan for individual farms. . ." While the concept behind this type of mitigation may be sound, the fact is that a very limited amount of funds are being committed to wildlife practices. There is no guarantee that those landowners who are participating in the program will have available funds remaining at the end of their long term agreements to implement those plans. It should also be stated that the cost-share rate for long term agreements is 75 percent, not 90 percent.

Response:

We agree that the funds being committed to wildlife practices are limited and there is no guarantee that voluntary agreed to practices will be implemented. There is a maximum of \$3,500 per farm under the regular program, but there are pooling agreement provisions that allow up to \$10,000 per year under LTA's with a \$35,000 maximum limit per farm. Once the LTA is written up and agreed to wildlife practices are included, the agreement is that all practices in the LTA will be implemented. The cost of wildlife practices is usually fairly small and much of the benefit to wildlife is obtained from set aside acreage for which there are no dollars spent but which greatly benefit wildlife. The text has been changed to clarify the cost-shared rates which are 75 percent for long term agreements and 90 percent for annual agreements.

48. Comment:

Page V-13, first paragraph, first sentence. The sentence implies that a mitigation plan is available. The final supplement should outline the plan and evaluate its impacts.

Response:

Appropriate changes have been made in the text to clarify the mitigation discussion and the evaluation of wetland impacts.

49. Comment:

Page V-14, paragraph 2. The text states that, "... SCS wetland policy was written to allow for certain policy exceptions, if necessary, to meet identified irrigation water management (water quality and water conservation) objectives". However, this draft includes no identification or discussion on what direction and/or policy exceptions the State Conservationist, SCS, Utah, has initiated to deal with the conflicts between improved irrigation management and the loss of wetland habitat.

Response:

All the conservation measures being implemented are on lands that have been cultivated four out of the last five years. Changes in irrigation induced wetlands are indirect. They result from reduction of water supply to them through increased efficiency of water use. Conflicts between improved irrigation water management and the loss of wetland habitat will be identified as part of the case by case environmental evaluation which SCS does routinely for every action. The individual environmental evaluation will be used by the State Conservationist to make case by case exceptions as provided for in SCS wetland policy. Exceptions will be granted only for those cases where wetland habitat loss cannot be avoided.

50. Comment:

Page V-23, paragraph 2. It is implied that agricultural practices in the Uintah Basin have created a monotypic habitat. This is not so. The canals, laterals, ditches, and fence rows support a great diversity of vegetation which, in turn, supports diverse communities of upland game, waterfowl, small mammals, and bird species. This paragraph should be expanded to describe accurately the habitat in and adjacent to the farmlands. Future agricultural practices with the project will create a more monotypic habitat unless care is taken to maintain the diverse vegetation along these important habitat areas.

Response:

The text has been modified as suggested.

51. Comment:

Page V-25, Classification Table. The classification table shown for lakes and streams does not identify any Class I streams. However, according to the 1978 Stream Evaluation Map for the State of Utah, the Duchesne River downstream from the mouth of the Uinta River (included in Lower Duchesne River Area Unit), is listed as a Class I highest-valued fishery resource stream.

Response:

We appreciate the comment. The table has been modified to include the Class I fishery.

52. Comment:

Page V-26, paragraph 1. This section is entitled "Environmental Consequences" but it is not stated which alternative(s) it should apply to. How can irrigation losses be inversely proportional to irrigation efficiency? We suspect the "irrigation losses" should instead read "wetland losses."

Response:

Appropriate changes have been made in the Environmental Consequences section.

53. Comment:

Page V-26. This section should address the effects of the project on groundwater quality.

Response:

A paragraph on groundwater quality has been added.

54. Comment:

Page V-26, first paragraph, last sentence. The words "irrigation losses" should be changed to "wetland losses."

Response:

The sentence in question has been deleted since the relationship is obvious.

55. Comment:

Page V-27. The discussion of water quality should address changes in the Duchesne and Green River systems as well as the Colorado River.

Response:

Appropriate discussion has been added to cover the Duchesne and Green River systems.

56. Comment:

Page V-28. With the discussion of erosion and sedimentation in the Environmental Consequences Section, the current status of erosion and sedimentation in the Uintah Basin should be presented in the Affected Environment Section. Also, see comments for page II-1, paragraph 2.

Response:

Appropriate changes and additions have been made in the text.

57. Comment:

Page V-29, paragraph 4. It is most likely that present ditchbank vegetation will be permanently eliminated. The present ditchbank habitat is comprised of a diversity of vegetative species, many of which are dependent upon water from the associated ditches. The elimination of these ditches will result in the loss of vegetation that cannot be replaced through the seeding of upland plant species.

Response:

We agree that some present ditchbank habitat will be eliminated. Appropriate changes have been made in the text to clarify this loss and the partial replacement with other areas that will be established.

58. Comment:

Page V-29, fourth paragraph, last sentence. Explanation of the term "managed appearance" would be helpful.

Response:

Appropriate changes have been made in the text.

59. Comment:

Page V-30, paragraph 1. We agree that implementation of the onfarm water management measures will require less water to be diverted for irrigation. However, the landowners who own the water rights may continue to divert the same amount of water in order to retain their rights. This water may in turn be used to bring marginal lands, which are presently nonirrigated, into production or irrigate some lands for which there is not a full source of water at present, thus offsetting the benefits of the onfarm program. The draft supplement fails to identify this problem, and how the SCS intends to deal with it.

Response:

Onfarm salinity control efforts are not expected to bring additional land under cultivation or change the principle

agricultural land uses. The main salinity control effects will be improvement in the timing and distribution of irrigation water application. As long as the water is used efficiently the salinity benefits will be realized.

60. Comment:

Page V-30, first full paragraph. Based upon the information provided on page II-1, second paragraph, the total wetland loss (which includes riparian, wetland, and grass-sedge habitat types) would be 13,000 acres. If there is a total of 48,760 acres of wetland habitat in the study area, there would be a 27 percent total loss in wetland habitat as a result of the project. The paragraph needs to be expanded and clarified to indicate the true adverse impacts of the project. (Table V-9 in Appendix C-9 also needs to be expanded to show the losses.)

Response:

Appropriate changes have been made in the text.

61. Comment:

Page V-30, paragraphs 2 and 3. As mentioned previously, to say that, "wildlife habitat maintenance and improvement features will be accomplished (voluntarily) through long term agreement with individual farmers," is misleading. This program cannot begin to adequately mitigate for the loss of over 19,000 acres of wetland habitat. In sentence 4, paragraph 2, the term "wildlife habitat" should be corrected to read "wetland habitat."

Response:

We realize the outlined program may not adequately mitigate the wetland loss to USDI's satisfaction. However, we believe it is the most viable option available and we will pursue it to the fullest. We have made the indicated correction in sentence 4, paragraph 2.

62. Comment:

Page V-30, paragraph 4. This discussion does not mention the importance of the edge habitat along ditches and fence rows for nesting, travel, and living areas for many species of wildlife. Much of the habitat along these ditchbanks includes riparian, as well as upland vegetation.

Response:

Appropriate changes have been made in the text.

63. Pages V-30, V-31, Upland Wildlife Habitat. An increased food source is a direct positive benefit to upland wildlife; however, adverse impacts, such as loss of important nesting and escape cover, should be evaluated to determine a net impact to upland

game populations. Without a definite mitigation plan, substantial losses to populations and the associated recreation hunting potential could be permanently lost as a result.

Response:

Appropriate changes have been made in the discussion of upland wildlife habitat. The discussion of mitigation was previously covered in response to EPA comments No. 2 and 8 and USDI comments No. 6, 7, 9, and 10.

64. Comment:

Page V-31, paragraph 1. Improved crop rotation with small grains will provide a good food course for upland game birds. However, the existing edge habitat along ditches and fence rows provides necessary escape cover for birds using the agricultural fields, and the elimination of the edge habitat will lower the value of the agricultural fields for upland game birds.

Response: Agreed.

65. Comment:

Page V-31, paragraph 3. The ". . . intensive wildlife habitat preservation and enhancement program . . ." needs to be identified and discussed. The meager attempt at mitigation through voluntary long term agreements can hardly be considered intensive.

Response:

The text has been revised to read, ". . . include an intensive effort to establish a voluntary wildlife habitat preservation and enhancement program. . ."

66. Comment:

Page V-36. We are disappointed and disturbed that the notice of the scoping meeting appeared in the Federal Register on August 26, 1980, and the scoping meeting was held on August 19, 1980 (page V-35).

Response:

The scoping meeting was held on September 9, 1981. The date of August 19, 1980, was in error and has been corrected.

67. Comment:

Page V-36. The multi-objective planning team referred to has not been active since initiation of the onfarm improvement programs by the Agricultural Stabilization and Conservation Service. Also, Also, there is a new interagency coordination procedure now whereby the Bureau Chiefs of Planning and Water Resources Divisions in Provo, Utah, consult directly with the SCS District Conservationists in Roosevelt, Utah. This aspect should be clarified.

Response:

Appropriate changes have been made in the text.

68. Comment:

Page V-40, Appendix A. It should be explained why the Consumptive Use (in column 4) varies for each of the alternatives with apparent fixed acreage and cropping pattern.

Response:

The Uintah Basin is a water short area. The water supply is generally unregulated because of lack of storage. Water supply exceeds demand during spring runoff and is less than demand during the late season. As the conveyance systems are improved and the level of management is raised, the water is distributed more uniformly over the fields and to the plant roots. Irrigators set priorities on their crops and limited late season supplies are generally applied to grain and corn while alfalfa and pasture are left unirrigated. This has the same effect on consumptive use as a change in cropping pattern. Also, the crop consumptive use increases as plants become more vigorous and as water is applied more uniformly throughout the growing season, thus consumptive use increases even though acreage and cropping pattern remain constant.

69. Comments:

Page V-45, Table V-8, Environmental Quality Account. To aid the reviewer in assessing impacts of the four alternatives this table should include a quantification of wildlife resources and habitat.

Page V-47, Table V-9, Irreversible or Irretrievable Commitments. This section should include as item 3 the loss of wetlands that cannot be mitigated with the voluntary program.

Response:

Tables V-8 and V-9 have been revised into Tables V-10 and V-11 to better display all aspects of the Environmental Quality Account for all alternatives. We believe that these tables provide an adequate quantification of wildlife resources for assessing impacts. We disagree, as stated previously, that the loss of wetlands is irreversible and irretrievable.

Colorado Water Conservation Board

1. Comment:

The information on pages III-3 and 4 is outdated and inaccurate.

Response:

SCS appreciates receiving the suggested revision of pages III-3 and 4, which is used in the EIS.

2. Comment:

The mitigation plan is not substantiated, and the need for mitigation is questioned.

Response:

The basic mitigation strategy is to acquire suitable river bottom land and manage these areas as wetland. Appropriate management techniques will be planned and implemented as need for habitat improvement.

Recommending mitigation for wetland losses conforms to SCS policy for compliance with NEPA which states in part ". . . SCS will coordinate its plans, . . . and recommendations for resource use so that Americans . . . are encouraged to attain the widest range of beneficial uses of soil, water, and related resources without degradation to the environment, . . . or other undesirable and unintended consequences."

3. Comment:

Length of growing season for Delta and Montrose is not consistent with difference in elevation.

Response:

The information shown is published on page 412, Colorado Yearbook, 1956-1958, Colorado State Planning Commission, and by the U.S. Weather Bureau. It is based on 20 years or more of USWB records (now NOAA).

4. Comment:

Line C-3 of Table A1-4, page A1-8 is mislabeled.

Response:

The error has been corrected.

5. Comment:

The Draft Supplemental EIS does not address using improved ditches to carry water for livestock during the winter season.

Response:

The cost for concrete ditch lining includes extra thickness of concrete to withstand frost and ice actions during the winter season. The Draft Supplemental EIS includes a statement to this effect.

6. Comment:

Why does the Lower Gunnison Unit require more land for mitigation of wetlands than the Uintah Unit?

Response:

Each state independently evaluated environmental impacts of program implementation. Value ratings for existing and enhanced wetlands are different between the two studies. The Lower Gunnison study shows wetlands being replaced with new wetlands.

Shavano SCD

1. Comment:

Installation of semiautomated irrigation systems should not be mandatory.

Response:

SCS believes that semiautomation can make a significant contribution toward improved irrigation water management and encourages its use.

However, the EIS has been modified to show that semiautomation is available to those who desire it, but is not required of all who choose to participate in the Salinity Control Program.

2. Comment:

The magnitude of salt reduction of Level 3 as displayed in Table IV-1, Page IV-5, is questionable.

Response:

This comment probably refers to the Potential for Onfarm Irrigation Improvements, Lower Gunnison Basin Unit Salinity Control Study, Colorado River Salinity Control Program, May 1981, a draft report and companion document to the draft supplement to the EIS, rather than to the draft EIS itself. The indicated reduction is about 75 percent of the present salt load carried to the Colorado River. A reduction of that magnitude is theoretical for two reasons. First, it is derived through mathematical simulation of effects that might be achieved by improvements in irrigation systems and practices in the area. Second, its achievement requires close adherence to, and full implementation of recommended improvements by all water users in the area. SCS believes a salt load reduction of that magnitude is possible with 100 percent commitment and participation by the local people. However, SCS recognizes that participation in the salinity control program, as with other USDA programs, is voluntary and that 100 percent participation may not occur.

3. Comment:

Limiting (cost-share) payments to \$3,500 per year per farmer is not too palatable.

Response:

Funding for implementing the Salinity Control Program in the Grand Valley and the Uintah Basin Unit has come through the Agricultural Conservation Program administered by the USDA's Agricultural Stabilization and Conservation Service. The \$3,500 annual limitation is a statutory constraint of the ACP that can be changed only by act of Congress.

4. Comment:

There should be no cost sharing unless an overall multiyear plan is developed. Long term agreements should be developed for each participant.

Response:

SCS agrees with the comment and encourages complete planning and the use of long term agreements. However, the ACP includes implementation of annual practices.

5. Comment:

The District is disappointed to learn that all activities for the first 10 years will be restricted to Delta County and believes that land east of the Uncompahgre River in Montrose County also should be included.

Response:

After considering comments received on the draft report the SCS decided to recommend Plan 7 for implementation. Plan 7 includes land east of the Uncompahgre River in Montrose County where some areas are recommended for intensive improvement. Minimum improvement, consisting of land leveling and installing water measuring devices, will be available to areas of Delta and Montrose Counties not otherwise recommended for intensive improvement.

6. Comment:

It seems somewhat ludicrous that SCS efforts will be directed toward onfarm improvements in one area while the Bureau expends improvement funds elsewhere.

Response:

Recommending Plan 7 for implementation alleviates this situation.

Colorado Historical Society

1. Comment:

The federal agency has outlined certain provisions in this document for cultural resource management to comply with Executive

Order 11593 and the Natural Historic Preservation Act as amended. Once these conditions have been adhered to, in consultation with this office, in accordance with 36 CFR 800, compliance will be achieved.

Response:

USDA will carry out its responsibilities in compliance with the National Historic Preservation Act as amended and will comply with Executive Order 11593.

Utah Division of Wildlife Resources (UDWR)

1. Comment:

Our greatest concern relates to the totally inadequate mitigation of impacted wildlife habitat. Paragraph 1 on page i of the document states that the supplement was written because "additional information now available from SCS environmental evaluation of USDA federally-assisted nonproject action underway, indicates that implementation . . . could cause significant adverse local or cumulative impacts on the environment." The Supplemental Statement fails to provide any acceptable mechanism for mitigating these significant impacts. We do not accept the statement on page V-30, paragraph 3, sentence 3, that the voluntary mitigation program has or will offset wildlife habitat losses. Mitigation would require quantitatively identifying project losses and likewise compensating for these losses quantitatively. There is no such plan on the voluntary approach under nonproject funding has not begun to compensate for impacts. The fact that the Supplemental Statement has been deemed necessary would indicate that the program has been planned as a project and yet it continues to be implemented as nonproject under ASCS cost-share funding. We do not support this approach and believe that the past two years of construction vividly demonstrate the significant wildlife habitat losses that will go unmitigated if the program continues as at present. Special project funding including that for adequate impact mitigation must be provided or the project should be terminated.

Response:

We agree that implementation of the onfarm portion of the Colorado River Water Quality Improvement program will cause significant cumulative wildlife habitat impacts. The first paragraph of the forward, on page i, states that is the reason for the impact statement. Since the onfarm measures are on

private land and the Colorado River Basin Salinity Control Act provides no economic incentive for mitigation measures, a voluntary mitigation program is the most viable alternative presently available. Long term agreements being developed include a significant amount of voluntary mitigation as stated in the response to EPA comments No. 2 and 8. The text has also been revised to clarify the mitigation discussion. We want to keep in perspective that wildlife habitat lost through improved irrigation systems and water management measures represents a minor portion of that originally created by irrigation of private farmland in the Uintah Basin. In addition, we are dealing with a conflict of environmental values (improved water quality and water conservation versus wetland loss). We think it is important to proceed with the implementation of onfarm measures to comply with the Salinity Control Act, and use the voluntary mitigation options available. However, we are also pursuing the legislative route to increase our authority in this area.

2. Comment:

Inside cover letter. There is no explanation on this page or anywhere throughout the document concerning the derivation of habitat units or acre values. These designations must be documented as to the supporting data base and there should be a thorough explanation of what is represented by their use.

Response:

Habitat value units and acre values are fully defined in the glossary on page VII-1. The quantification of these terms as used in the report were derived by onsite analysis and supporting data are on file and available for review by interested parties at the SCS State Office, Federal Building, 125 South State Street, Salt Lake City, Utah 84147.

3. Comment:

Page ii, paragraph 2, sentence 4. Under current project guidelines there is no mitigation. The very few wildlife projects planned by individual farmers are not addressing specific losses nor are they intended to compensate for losses at any identifiable level. There is no relationship to any planned mitigation and the implementation of these scattered and relatively insignificant wildlife practices.

Response:

The discussion of mitigation has been revised to further clarify the mitigation issue. We believe that mitigation will take place, but it may be at a level that UDWR does not consider to be satisfactory. See also responses to EPA comments No. 2 and 8 and UDWR comment No. 2.

4. Comment:

Page iii, paragraph 2, sentence 1. We would agree that if the project continues to be implemented as it has to date, there will be no significant impact mitigation let alone full mitigation for wildlife habitat losses.

Response: Noted.

5. Comment:

Page II-1, paragraph 2. Those acres identified separately as riparian habitat, wetland habitat, greasewood and saltcedar, and grass-sedge habitat are, in fact, all wetland habitat types and should be identified as such.

Response:

We agree these are all wetland habitat. The various types were quantified into habitat types to give the reader a better picture of the actual kinds of impacts and their relative value to wildlife.

6. Comment:

Page II-2, paragraph 1, sentence 2. Again, the identification of the wildlife practices as project mitigation is not correct. There are no quantitative project losses with related quantitative mitigation compensation. If this were done, it would indicate that there is no significant mitigation occurring in the Uintah Basin Unit.

Response:

We disagree that wildlife practices being voluntarily implemented are not mitigation. By definition (see paragraph 1508.20 of the CEQ Rules and Regulations) they are. The program implementation may not leave all the wildlife habitat originally created by farming operations available for use by wildlife but other measures installed for wildlife use and in some cases lands set aside exclusively for them is mitigation.

7. Comment:

Page III-2, paragraph 2. We agree that there will be significant adverse impacts to wildlife. The supplemental impact statement fails to indicate how the significant impacts will be adequately mitigated. It needs to be noted here also that the water management measures in the Uintah Basin Unit are being constructed and are already causing significant adverse impacts.

Response:

We agree that water management measures are being constructed by individual farmers in the Uintah Basin. The rate of installation has recently been accelerated by additional funds allocated

to the basin through the agricultural conservation program (ACP) of ASCS. SCS has accelerated technical assistance to allow farmers to apply such practices. This acceleration will cause the cumulation of adverse impacts to wildlife and thus this EIS is being prepared. We do not agree that significant adverse effects to wetlands have occurred as a result of the initial implementation on individual farms. The mitigation question has been previously addressed in responses to comments No. 1, 3, and 6.

8. Comment:

Page V-1. There is no realistic no action alternative as construction under accelerated federal funding is entering its second year. Four million dollars have been spent or committed in the Uintah Basin Unit to date.

Response:

To implement a no action alternative may not be realistic, but to consider it is realistic. The no action alternative provides the base from which to predict effects of various action alternatives. This is the reason agencies are required to consider a no action or future without action alternative.

9. Comment:

Pages V-12, V-13, Mitigation. This entire section of the supplemental statement very clearly demonstrates the inadequacy of the "mitigation" proposal. The current program which is the preferred alternative relies exclusively on voluntary commitments of landowners for what is called mitigation. While SCS may be making every effort to include wildlife practices in the conservation plans, a look at the success of this effort to date leaves no doubt that it is not working. As of June 2, 1981, four million dollars have either been spent or committed to the onfarm ASCS funded salinity reduction program in the Uintah Basin. Of this total, only \$16,341 have been committed to wildlife practices over 116 conservation plans under long term agreements. Out of one million dollars committed for 1981 in Duchesne County, only \$439 have been committed to wildlife practices. The suggestion that this be termed a wildlife mitigation plan that will offset losses (page V-30, paragraph 3, sentence 3) is totally invalid.

Response:

The mitigation section has been rewritten to further clarify the mitigation issue. When individual farmers are limited to a total of \$35,000 each in cost-share money for the 10-year allowable installation period of the LTA and the cost of needed improvements exceeds this amount, they are reluctant to use part of their allotted amount for wildlife mitigation when there is no economic return for the money spent. If the law

were revised to provide some incentive, or if the wildlife interests were willing to pay for habitat, most farmers would be willing to make higher commitments to wildlife mitigation.

During the planning process measures for wildlife habitat maintenance and improvement are discussed with each landowner. Almost without exception they are sympathetic to wildlife needs and a majority of the LTA's have measures for wildlife habitat improvement in them. Most wildlife measures are scheduled for installation after the first couple of years so the money has not been committed.

Dollars spent on wildlife habitat improvement and maintenance are not an accurate measure of the benefits to wildlife. Conservation measures are not being installed on lands which have not been farmed at least 4 of the last 5 years so many acres will not be disturbed and will be left for wildlife use.

Probably the greatest benefit to wildlife will accrue incidentally as sprinkler irrigation systems are installed. Many fields in the basin are odd shaped and sprinkler irrigation systems are not easy to fit to them. As a result, many odd areas will be left out of the system and therefore out of cultivation. Many of them will be fenced and seeded for wildlife.

10. Comment:

Page V-12. The last sentence in paragraph 1 is very misleading. There is no requirement that landowners include any wildlife practices in their conservation plan of operations and thus the indicated agreement would be valid only if a practice is agreed to. As we have shown, the amount of money spent or committed on wildlife practices is very small.

Response:

The statement is correct as written. However, it has been modified for clarity. The contents of the conservation plan are determined by the landowner in consultation with the SCS planner. The practices for wildlife are discussed with every farmer and most of the plans contain some measures for wildlife. The schedule for installation is usually later in the agreement period so the amount committed for wildlife to date is low.

11. Comment:

The second paragraph on page V-12 states that, "wildlife practices have been available at a 90 percent cost-share rate." This is again misleading, as only on annual agreements has this 90 percent cost-share rate been available. On long term agreements the cost share for wildlife practices is 75 percent which is the same as for the irrigation improvement features of the program. To our knowledge, all money committed to wildlife practices has been under long term agreements at this 75 percent cost-share rate. (See also page iii, paragraph 1.)

Response:

The statement about 90 percent cost-share rate is correct as written. However, we have revised the text to explain that the 90 percent rate applies only to annual agreements and that the rate for long term agreements is 75 percent, the same as for irrigation practices. It is true that most wildlife practices installed to date have been at the 75 percent rate under LTA's. Most wildlife practices in the 86 LTA's planned to date and the approximately 34 being planned each year are scheduled for the second or third year of the agreement so have not yet been installed.

12. Comment:

Paragraph 3 on page V-12 suggests that the USDA wetland mitigation options could be included as part of the Department of Interior's Bureau of Reclamation off-farm mitigation plan. It seems a doubtful proposal to ask one agency to fund the mitigation for another agency's project. We are aware of no commitments by the Bureau of Reclamation to pickup the tab for negative impacts generated by the onfarm program nor do we think this would occur.

Response:

We agree that there is no present comment from USBR for the off-farm mitigation plan to include mitigation measures for onfarm losses. However, paragraph 1502.14 of the November 29, 1980, CEQ Regulations for Compliance with NEPA indicates that the alternatives section should deal with options that are not within the jurisdiction of the lead agency. They direct that the proposal and alternatives be presented in comparative form clearly defining the issues and providing a clear basis for chance among options. The mitigation scenarios presented are an attempt to do that.

13. Comment:

The third mitigation proposal on page V-13 would be the only reasonable approach to project implementation. The elimination of the ASCS farm by farm nonproject cost-share program as a tool for salinity program implementation is necessary if project losses are to be mitigated. This would necessitate Congressional approval of the salinity program as a special project with subsequent appropriation of funds including those necessary for adequate mitigation of losses. The voluntary approach is not and will not work. Valuable wetland losses will go unmitigated and wildlife populations dependent on this critical habitat will be seriously impacted.

Response:

We agree the third mitigation proposal is the only one which would allow full mitigation of wildlife habitat losses. We

disagree that elimination of the ASCS cost-share program is necessary if losses are to be mitigated. Implementation of the measures necessary to comply with the Salinity Control Act will leave some losses unmitigated, therefore, all voluntary creation and/or replacement of wildlife habitat will be extremely valuable. If the voluntarily created habitat is of better quality than what is lost, wildlife will be better off. One farmer in the Uintah Basin has already implemented planned wildlife habitat improvement using his own funds even though cost-share money is available; generally, some economic incentive is needed to provide full mitigation. Wildlife will still be better served if farmers are willing to seek assistance from SCS and ASCS. Extreme pressure from wildlife interests may result in more losses to wildlife if private landowners are not compensated.

14. Comment:

Page V-23, paragraph 2. Uintah Basin farming practices have not resulted in a monotypic habitat with very little vegetative diversity. To the contrary, the Uintah Basin offers some of the best onfarm vegetative diversity in Utah and has some of the State's best upland game and waterfowl populations. The fence rows and ditches add significantly to this diversity and project impacts will be substantial as these are eliminated. The future with the project will be much as described with larger blocks of much more monotypic habitat minus more than 1,500 miles of onfarm earthen ditches.

Response:

We agree that the Uintah Basin offers some of the best vegetative diversity in Utah. The statement as written does not clearly define what was meant. The paragraph has been rewritten to clarify the point.

15. Comment:

Page V-24, paragraph 3. The bald eagle is a winter visitor to Utah and is not here during the nesting season.

Response:

The above information has been added to the text.

16. Comment:

Page V-26, paragraph 1. The words "irrigation losses" should be "wetland losses." We fail to see the relationship of wetland losses as being inversely proportional to improved irrigation efficiency. The supposition needs some supporting data.

Response:

The sentence in question has been eliminated.

17. Comment:

Page V-26, paragraph 4. This sentence identifies the preferred plan as the selected plan. There really are no alternatives as the plan has not only been selected, but implementation has been ongoing for some time as previously noted.

Response:

The word selected has been changed to recommended, and is the plan under which a limited amount of site specific implementation in the basin is occurring.

18. Comment:

Page V-29, paragraph 4. It is most probable that the elimination of ditches will result in the permanent elimination of the ditch bank vegetation. Many field borders will be eliminated as larger sprinkling systems replace existing ditches and fence lines.

Response:

The paragraph has been rewritten to clarify the situation. The word temporary has been deleted and other information added.

19. Comment:

Page V-30, paragraph 1. Although plan implementation will require less water to be diverted, we believe that the value of water will result in the farmer continuing to divert the same amount to maintain his same water right. This obviously defeats program objectives, but SCS has failed to provide an answer to this question asked at many public meetings. If the farmers did give up any diversion rights, then this water would again be made available for reappropriation by the Utah Division of Water Rights.

Response:

See response to EPA comments No. 1, 6, and 7.

20. Comment:

Page V-30, paragraph 2, sentence 4. The words "wildlife habitat" should be changed to "wetland habitat." Over 40 percent of the wetland habitat in the project area will be lost. This will greatly impact upland game and waterfowl populations as well as many other wildlife species.

Response:

We agree with the suggested change. The word wildlife has been changed to wetland. Forty percent of irrigation induced wetland habitat will be changed back to upland farm associated wildlife habitat.

21. Comment:

Page V-30, paragraph 3. As the project is now being implemented, the existing wildlife habitat monitoring program should be fully explained. The statement in sentence 3 is incorrect. The voluntary program will not begin to offset the loss of 19,860 acres of wetland habitat.

Response:

We agree. The wording has been changed to clarify the situation. A new section on monitoring has been added to the recommended plan. We disagree that the voluntary mitigation will not offset some of the wetland habitat loss.

22. Comment:

Pages V-30, 31, upland wildlife habitat. The real benefit of the project impacted upland habitat is overlooked in this explanation. Travel corridors and nesting habitat in these extensive narrow strips that are uncut during harvesting are of immense value to wildlife populations.

Response:

Some additional explanation has been added to the upland wildlife habitat subsection to quantify this impact.

23. Comment:

Page V-31, paragraph 3, sentence 2. To characterize the present wildlife habitat preservation and enhancement program as intensive is in error. It is a minimal effort at best.

Response:

The text has been revised to clarify that an intensive effort is being made to establish a voluntary wildlife habitat preservation and enhancement program. The SCS has assigned two field biologists to the area and USFWS has detailed a biologist to the SCS field office to assist in planning wildlife habitat maintenance and improvement practices.

24. Comment:

Pages V-35, 36. Public Meetings. There are serious questions that should be answered concerning the August 19, 1980, public meeting in Roosevelt. Our agency was unaware of the meeting until one day before it took place. We were unable to attend. The Federal Register notification of the meeting occurred one week after the meeting as noted on page V-36. In addition, the public notice in the local newspaper announcing the meeting appeared two days after the scoping meeting was held. The reasons for this should be explained.

Response:

The August 19, 1980, date listed on page V-35 was in error. It has been changed to read September 9, 1980. Preliminary announcement of the scoping meeting was made July 22, 1980, at the State Environmental Coordinating Committee (ECC) meeting. On August 12, 1980, announcement was made at ECC meeting that the scoping meeting would be held September 9, 1980, and information about the program and a copy of the notice to be published in the Federal Register were handed out to the members. On August 26, 1980, the notice was published in the Federal Register. On August 27 a letter with a copy of the fact sheet and Federal Register notice was mailed to the Utah Division of Wildlife Resources and 288 other interested parties. Newspaper articles were also published in local and Salt Lake City papers. The scoping meeting was held September 9, 1980, at 8:00 p.m. in Roosevelt. There were 31 people including a representative of the Utah Division of Wildlife Resources in attendance.

25. Comment:

Page V-36, paragraph 3. To our knowledge, the multi-objective planning technical team for the off-farm salinity program has never actively functioned. There have been some public meetings, but no formal technical team organization or meetings have occurred. We have requested participation with the environmental subteam and have yet to see it organized and functioning.

Response:

The multi-objective planning technical team is under the direction of the U.S. Bureau of Reclamation.

26. Comment:

Page V-46, A.2. Although the elimination of 1,540 miles of earthen ditch involves visual changes, it should more appropriately be placed in Section C. Table V-9 addresses only the preferred plan and provides no comparisons with other alternatives as is done on Tables V-3 through V-8.

Response:

We have eliminated Tables V-8 and V-9. Table V-11 has been changed to Table V-8 and it now displays the EQ account for all alternatives.

27. Comment:

Pages V-46, 47, C.2-5. All are wetland habitat types and should be identified as such.

Response:

We believe the habitat types used better define the land in question than to blanket them under the broad definition of wetlands. The relationships of wildlife habitat types to wetlands as defined by Circular 39 are explained in detail in appendix E "Biologic Resources Inventory" of the USDA Salinity Report for the Uintah Basin. The definition of Type I Wetland from Circular 39 could be applied to almost all flood irrigated land in Utah.

28. Comment:

Page V-47, E. Loss of nearly 20,000 acres of wetlands should be noted as an irretrievable commitment with the adoption of the preferred plan.

Response:

We disagree that the conversion of 20,000 acres of wetland to upland habitat is irretrievable. These acres were essentially created by poor irrigation efficiency. Although it would not be desirable, poor operation and maintenance in the future could result in wetland systems returning. Therefore, they are not an irretrievable loss. In addition, from another perspective it could be said that since these acres, along with 40,000 additional acres, were created by irrigation the effect of onfarm irrigation and farming practices is a net gain of 40,000 acres of wetlands.

C. Letters Received on the Draft EIS

The following letters were received on the Draft EIS.



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

REGION VIII

July 22, 1981

IN REPLY REFER TO:

8S0Q-0590d

Mr. Charles F. Lemon
Soil Conservation Service
West Technical Service Center
511 N.W. Broadway
Portland, Oregon 97209

Dear Mr. Lemon:


Thank you for the opportunity to review and comment on the draft supplement to the Colorado River Water Quality Improvement Program Final Environmental Impact Statement (EIS).

This document has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). The review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas.

There is a substantial difference in the cost to construct each alternative. The number of permanent and temporary jobs created should be identified and explained for each alternative. This approach would facilitate the determination of the need for housing and services for each alternative.

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer, at FTS 327-3102 in Denver.

Sincerely,



Raymond D. McKinney
Director
Program Planning and Evaluation



SUBJECT: Review of Draft Supplement to the Colorado
River Water Quality Improvement Program

JUL 22 1981

TO: Charles Lemon, Director
West Technical Service Center
Soil Conservation Service

THRU: David Montoya, Director *DM*
Equal Opportunity and Civil Rights
Soil Conservation Service

We have reviewed the Soil Conservation Service (SCS) Draft Supplement to the Colorado River Water Supply Quality Improvement Final Environmental Statement. Our review focused on whether your proposed work will adversely affect the minority population located in or near the work area.

Your draft supplement does not contain a reference to the civil rights impact statement, as required by SCS Guidelines for Compliance with NEPA. Specifically, your draft supplement does not indicate how minority residents in the basin units will be affected by your work efforts. Additionally, it does not identify the minority population in the Uintah Basin Unit.

We recommend that your final statement explicitly indicate the impact (favorable and unfavorable) your proposed work will have on minorities. Factual data including statistical information should be included to substantiate your conclusion concerning the civil rights impact. Also, the minority population should be defined for the Uintah Basin Unit, just as the minority population for the Lower Gunnison Basin Unit is defined. The geographical location of minorities within the basin units should be identified. If there are individuals who will receive tangible benefits from the proposed work, they should be racially identified.

In future impact statements, when addressing the economic impact of proposed work efforts, you will want to consider using the term "work-years" or "person-years." The Federal Government is attempting to use sex-fair language in its programs at all times.

Thank you for this opportunity to review your draft supplement.

James Frazier
JAMES FRAZIER
Director



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

1860 LINCOLN STREET

DENVER, COLORADO 80295

AUG 5 1981

Ref: 8W-EE

Charles F. Lemon, Director
Soil Conservation Service
West Technical Service Center
511 N.W. Broadway
Portland, Oregon 97209

Dear Mr. Lemon:

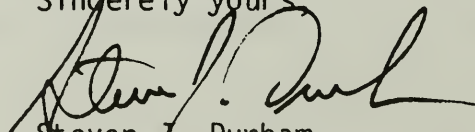
The Region VIII Office of the Environmental Protection Agency has reviewed the draft supplement to the Colorado River Water Quality Improvement Program Final Environmental Impact Statement, dealing with salinity control programs in the Lower Gunnison Basin and Uintah Basin Units. The EIS describes in a generally adequate manner the important environmental issues involved with these projects.

There are two principal areas that concern EPA. The first involves the effectiveness of off-farm and on-farm salinity projects when viewed in light of the water rights laws in Utah and Colorado. We are concerned about whether the "saved" water from various conservation techniques can be used in accordance with existing water rights practice and still achieve the benefits of salinity control.

Our second concern deals with the effectiveness of mitigation measures in trying to restore wildlife habitat that would be lost as a result of the salinity control measures. We are concerned that the voluntary program for restoring wildlife habitat as it is now constituted, may not prove to be an adequate incentive for restoring lost wetland and wildlife areas. These and a number of other issues are discussed in more detail in the attached comments. We also note that the relationship between U.S. Bureau of Reclamation efforts and the present USDA efforts on salinity control activities in these basins needs to be clarified and coordinated.

Based on the EPA system for evaluating environmental impact statements under our review, we have rated this EIS as ER-2. This means we have some environmental reservations and that the above mentioned issues need further evaluation and resolution. Please contact Mike Gansecki of my staff (FTS-327-4831) for further assistance on this matter.

Sincerely yours


Steven J. Durham
Regional Administrator

Enclosure

DETAILED COMMENTS OF THE ENVIRONMENTAL PROTECTION AGENCY
ON THE DRAFT SUPPLEMENT TO THE COLORADO RIVER WATER QUALITY IMPROVEMENT PROGRAM
FINAL EIS FOR LOWER GUNNISON AND UINTAH BASIN UNITS

1. Actions Under Consideration in this EIS. The proposed actions and timing in this EIS need clarification. Although this EIS is regarded as a cooperative effort (p. i) with the U.S. Bureau of Reclamation (previously Water & Resources Power Service), the proposals are largely USDA efforts. On page ii it is noted that "the off-farm mitigation plan to protect wildlife habitat associated with improvements to canals and laterals. . . is yet to be developed by Water & Resources Power Service for the Lower Gunnison and Uintah Basin Units."

Further on page IV-2, the table shows off-farm costs on six of eight alternatives. The explanatory footnote there suggests "a limited amount of off-farm ditch lining. . . to assure proper operation of on-farm improvements." Thus it appears that not all off-farm proposals and costs are included in this document. Again it is not clear whether these off-farm improvements would be funded by USDA or USBR.

EPA has received communications from the U.S. Bureau of Reclamation in May and June, 1980 indicating that they are considering a wide range of off-farm concrete lining alternatives that may range in cost to as high as \$100 to \$200 million dollars in capital expenditures. We think it is important to identify the full proposals of both agencies and their costs for these two salinity units; overall considerations of cost/benefit and cost-effectiveness as well as environmental impact should be done for the entire project. We would appreciate your clarifying the reasoning behind the separate agency approach that has been taken with this EIS.

2. Alternatives Analysis. Little attention and analysis was given to the alternative of selective withdrawal of irrigable lands having high salt-generating characteristics in the Lower Gunnison Basin Unit. Categorical retirement of all irrigated land in the valley was of course suggested by the Water Resources and Power Service at a public meeting and was eliminated from further consideration because of opposition by the local people. We could understand why there would be local opposition to an alternative that would eliminate the principal industry in the valley. What EPA suggested in its scoping letter of June 16, 1980 on the Lower Gunnison Salinity Unit was the more modest proposal to consider land withdrawal on a selective basis. This alternative was in fact considered for the Uintah Basin Unit. We ask that you explain why such an alternative was also not considered for the Lower Gunnison area.

We believe that technical and water rights considerations play an important part in determining if selective land withdrawal makes any sense economically. We would enquire whether geologic and soils conditions in the Lower Gunnison Basin valleys are such that certain definable subareas (near outcrops of Mancos Shale, for example) contribute significantly more salt than the rest of the irrigated lands. If so, have ground water characteristics been measured over time and with sufficient sampling, to be able to pinpoint the highly saline areas? Do the data show any obvious patterns of salt concentration? Until such a technical analysis is done, it is difficult to recommend for or against the cost-effectiveness of a selective land withdrawal alternative solution. The alternative should not be dismissed out of hand, at this point in time.

The analysis of selective land withdrawal in the Uintah Basin Unit shows that local opposition need not arise with selective land withdrawal. The issue of what happens with the water made available from the retired lands appears to be the critical determinant of local opposition or support. The EIS should have included an analysis of Utah's and Colorado's differing water rights systems and how they affect and are affected by the question of selective land withdrawal.

3. State Water Law and Salinity Program Effectiveness. Very little discussion has been presented on Utah and Colorado water rights law as each affects the overall salinity control efforts in the two Units. We think such a discussion is necessary to ensure that the principal benefits of this program (namely salinity reductions) do in fact take place as planned. Most of our comments are in the nature of an inquiry; we are aware of some of the water rights aspects and pose what we take to be possibly important questions that have not been addressed in the draft EIS.

Uintah Basin

As we understand the situation, the State Engineer under Utah's prevailing water rights system issues permits to divert a certain flow of water based on the amount of existing irrigable land. We also understand that because there are generally more irrigable acres than available water in the Uintah Basin (particularly towards the end of the irrigation season), that some of these lands are not irrigated (either they are dry-farmed or allowed to lie fallow) in any given year.

If the salinity control measures result in a significant water consumption or application savings, wouldn't this "saved" water then be redistributed to those fallow or dry-land irrigable acres by their owners? Wouldn't this then have the potential effect of increasing the total amount of land actually irrigated, increasing the amount of leached salts, and negating somewhat the effects of the overall salinity reduction?

Under the same assumptions as mentioned above, how would the situation work with selective lands withdrawal? The EIS indicates on page V-7 that "the water right for the retired land would be forfeited." Has the State Engineer already made this determination? What would happen to the "forfeited" water? Would it have to be left instream and flow out of the basin until new irrigable land was developed?

The EIS suggests on page V-27 that the "saved" water from the recommended plan will accrue to various streams feeding the Duchesne River. EPA supports the concept of maintaining minimum flows in-stream for aquatic benefits; we must ask however, whether this will in fact occur under the Utah water rights system.

Lower Gunnison Unit

Our understanding of Colorado water rights law is that this system differs considerably from Utah's. In Colorado, a water right is treated generally as a transferable property provided that no injury to junior users occurs. We would like to know about the eventual use of the "saved" or conserved water from the salinity control activities.

The EIS did not provide any details on the water budget for the various Lower Gunnison Unit alternatives as was done for the Uintah Basin evaluation. The SCS document "Potential for On-Farm Irrigation Improvements- Lower Gunnison Basin Unit Salinity Control Study" however, provides essentially the same water budget information. This report indicates that implementation of the preferred plan could reduce the annual amount of water now diverted to Lower Gunnison Basin irrigation by 545,000 acre-feet annually. The report also indicates that deep percolation and return flows could decrease from the present by 356,000 acre-feet per year. The consumptive use of the water in the preferred plan would increase perhaps by some 67,000 acre-feet over the present, measured as a change in the net application to the land.

There are thus potentially major shifts in historical diversions, consumption, and use patterns that would occur as a result of these salinity control measures. Individual diverters will be drastically reducing their intakes. More water will be available at certain downstream points. This raises the question as to how the State priority system will adjust to these changes. Are there likely to be many challenges to these historical changes in water use patterns?

In the South Platte basin, any change in the historical amounts of seepage and use are resisted legally because of the presence of many alluvial well users. Are there any similar well users in the project area who may be affected?

There also appears to be a modest increase in the consumptive use of the applied waters over the present. Will this be a problem in view of Colorado's doctrine of limiting changes to historical consumptive patterns? Will there be any need to provide make-up water for this added consumption? Does the projected decrease in water available to phreatophytes (in wetland areas, in surface drainage areas) compensate for this increased on-farm consumption? Finally, what is the likelihood, if any, of farmers opening up new irrigable land in the lower Gunnison area, given the additional amounts of water which may be at least temporarily available at upstream locations?

It may well be the case that these water rights issues have already been addressed, but our review and knowledge is limited to the EIS and other information mentioned in this review. From our experience, any water quality activities affecting quantity must be carefully integrated with prevailing water rights law to be successful.

4. Wildlife Mitigation Efforts

Wildlife habitat mitigation for wetland losses is well integrated into the presentation of alternatives in this EIS document. Considerable work has gone into predicting different levels of habitat loss under alternative assumptions. EPA's principal concern is with how the mitigation will take place.

On pages IV-23 to IV-25, three mitigation strategies are presented. The first alternative is cost-shared voluntary mitigation only, which is said to be the most likely mitigation strategy. A second mitigation strategy mentioned would be for Congress to authorize and fund wetland mitigation by the USDA at the time it approves funding for the Lower Gunnison Unit. The third alternative suggests that Congressional funding could be provided at the time when the U.S. Bureau of Reclamation proposed wildlife mitigation for its part of the projects.

EPA is concerned that the first mitigation alternative may not contain much of an incentive to accomplish the goal of wildlife habitat mitigation. Cost-share limits are low relative to the cost of irrigation improvements for any given operator. This forces the farmer to choose between using scarce federal dollars for irrigation improvement work (which should yield financial returns) or for wildlife mitigation (with minimal financial returns). Given that kind of choice, the use of cost-share funds for wildlife may be rare. One possible way to avoid this dilemma would be to have a separate cost-share account for wildlife habitat improvement that is available over and above the cost-sharing for other work. Such an approach would require changes in past USDA policy.

It is also possible that the funding for wildlife habitat could be integrated with the U.S. Bureau of Reclamation's efforts. In view of our earlier comments that close coordination of both agencies' efforts should be made to identify and develop an integrated salinity project for each basin, perhaps the EIS should be deferred until the U.S.B.R is ready to proceed with its program for salinity control and wildlife mitigation.

EPA also wishes to point out that not all land is equally valuable as wildlife habitat. It may be more cost-effective to pay 100% mitigation costs in carefully selected areas than to pay a 75% share on scattered plots (farmer choice) that may be of limited usefulness to wildlife. While there is some opportunity to substitute upland habitat for wetland, improvement of key riparian wetlands is an important component of mitigation that may not necessarily appeal to individual farmers.

Phased development which involves taking the most saline areas first, is a positive approach from both an environmental and economic standpoint. Evaluations on a periodic basis, such as the five years suggested here, are certainly needed. These evaluations should include not only the effectiveness of Best Management Practices, farmer acceptance, and effectiveness of salinity control, but also assurances that wildlife mitigation is keeping pace with overall project implementation.



DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

SPKED-W

27 July 1981

Mr. Charlie F. Lemon, Director
Soil Conservation Service
West Technical Service Center
511 N.W. Broadway
Portland, OR 97209

Dear Mr. Lemon:

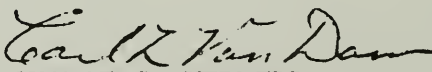
The Draft Supplement to the Colorado River Water Quality Improvement Program, Final Environmental Impact Statement, transmitted to the Executive Director of Civil Works, Office of Chief of Engineers, has been referred to Sacramento District for direct reply.

We have reviewed the Draft Supplement and have concluded that the on farm and selected lateral work anticipated under USDA programs will not conflict with nor adversely affect flood control, navigation, or other jurisdictional responsibilities of the Corps of Engineers.

Where the proposed work would involve a discharge of dredged or fill material into upland irrigation systems or wetlands which have been created by past irrigation practices, the work would be exempted from regulation under Section 404 of the Clean Water Act (33 USC 1344). In the event that some of the work involves a discharge of dredged or fill material into natural stream channels which are used for irrigation or irrigation return flows, the work would come under the purview of Section 404. If, in your future planning, it becomes apparent that discharges subject to Section 404 will occur, we suggest that you contact us well enough in advance to allow for the processing of a Department of the Army permit application.

Thank you for the opportunity to provide review comments.

Sincerely,


GEORGE C. WEDDELL
for Chief, Engineering Division

Copy Furnished:
HQDA (DAEN-CWP-V)
SPDPD-R

CTS



United States
Department of
Agriculture

Forest
Service

ASHLEY NATIONAL FOREST
Vernal, Utah 84078

Reply to: 1950

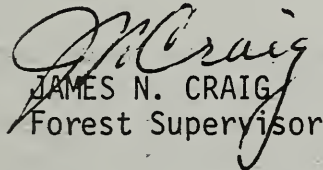
Date: June 29, 1981

Charles F. Lemon, Director
Soil Conservation Service
West Technical Service Center
511 NW Broadway
Portland, OR 97209

Dear Sir:

The Ashley National Forest has reviewed the draft supplement to the Colorado River Water Quality Improvement Program Final Environmental Impact Statement.

That portion of the supplement dealing with the Uintah Basin Unit relates to areas adjacent to the Ashley National Forest. However, we see no effects or impacts on National Forest lands or management practices from actions proposed by the supplement. Therefore, our input for the supplement can be summarized as "no comment".


JAMES N. CRAIG
Forest Supervisor





United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER-81/1175

AUG 18 1981

Mr. Charles F. Lemon, Director
West Technical Service Center
Soil Conservation Service
Portland, Oregon 97209

Dear Mr. Lemon:

We have reviewed the draft supplement to the final environmental statement on the Colorado River Water Quality Improvement Program, Lower Gunnison Basin Unit, Montrose and Delta Counties, Colorado, and Uintah Basin Unit, Duchesne, Wasatch, and Uintah Counties, Utah. We have the following comments and recommendations. Specific comments are attached and arranged by section designation and page number.

We believe the document is deficient in fully disclosing and analyzing environmental consequences of the salinity control actions for the following reasons.

1. The discussion of the environmental consequences for each unit is incomplete. CEQ regulations require a presentation of the impacts for each alternative in enough detail to form the scientific and analytic basis for the comparison of alternatives. Many of the major impacts mentioned in the discussion of alternatives (e.g., wetland habitat losses) are not discussed in this section at all (Lower Gunnison Basin) or are discussed generally without any comparison of the different impacts of the various alternatives (Uintah Basin).

2. The Department's Fish and Wildlife Service provided written scoping comments to the State Conservationist on October 1, 1980. Several items raised in that letter have not been adequately addressed in the draft supplement. These include: (1) impacts of instream flow changes and water quality changes on fish and wildlife habitats and downstream water rights; (2) use of the Agriculture Conservation Program (ACP) to achieve salinity control; (3) the overlap between ACP efforts and SCS watershed planning in the Uintah Basin; and (4) coordination between USDA and our Bureau of Reclamation's (BR) salinity control efforts in the two basins.

3. The no action alternative for the Uintah Basin appears to be discussed under "continuation of ongoing programs." The ongoing program in the Uintah Basin includes measures being implemented by USDA (SCS/ASCS) for salinity control with cost-share funds under ACP. It is our understanding that the supplement is after-the-fact to what has been occurring in the Uintah Basin for the last two years. The statement should acknowledge this, and an alternative which considers no Federal participation should be included.

4. The SCS, on April 14, 1980, requested a list of endangered species that might occur in the Lower Gunnison project area, and this was provided by our FWS. However, the SCS never prepared a biological assessment addressing the possible impacts of the project on these listed species. A biological assessment is needed because the proposed action is a "construction project," and NEPA compliance is being satisfied by preparation of an EIS. The FWS does not believe that one sentence in the draft statement, "none of the listed species appear to be affected by the proposed action," is an adequate biological assessment. Endangered species consultation with our FWS should be completed for the Lower Gunnison Basin Unit, and the results presented in the EIS.

5. There are many inconsistencies in the document when discussing wetlands. Acreage figures vary considerably and the totals do not compare in different sections of the document for the same project area. Terms such as "habitat units," "acre values," and "maximum implementation" are not defined nor is the source of this information referenced. In contrast, some important sources of information appear to have been overlooked. The SCS has prepared two reports dealing with wetlands in the two project areas - "Lower Gunnison River Basin Wetland Inventory and Evaluation," in 1979, and the "Uintah Basin Wetlands - Land Use Study," 1980. Wetland information in the supplement is not consistent with information in these reports. These two important sources of information should have been used in the preparation of this draft supplement.

We strongly disagree with the discussions of mitigation and conflicts between wetlands protection and salinity control as it is presented for both project areas. We agree that wetland habitats will be adversely impacted by salinity control measures, but disagree that mitigation of these losses would be in conflict with salinity control efforts.

As pointed out in the draft supplement, SCS has authority and responsibility for mitigation of wetland losses under its own NEPA regulations, Executive Order 11990 (Wetlands Protection), and USDA policy. This, coupled with the interagency cooperation mandated by Title II of the Salinity Control Act appears to make a strong case for developing effective mitigation features in each basin and relating them directly to each salinity control action.

Ignoring, postponing, or relying on voluntary, cost-share programs alone for mitigation needs will not accomplish the coordination of Federal efforts as called for in Title II. We believe that available USDA programs can be used to effect a more timely and parallel approach to the problem of wetland loss. Salinity control actions and their appropriate mitigation features should be planned and implemented concurrently. The draft supplement fails to analyze the expected impacts from this coordinated viewpoint, and we recommend that this be done in the final supplement.

The document indicates that the most likely plan will involve the use of the ACP which is the present course of action in the Grand Valley and the Uintah Basin. It is also shown that the ultimate level and type of mitigation will depend upon: (1) the final USDA program (currently ACP); (2) possible Congressional approval of a project area mitigation program; and (3) the off-farm mitigation program of our BR. It is not clear whether or not these concepts (page ii) have been considered as alternatives or incorporated into any of the alternatives. We recommend that the supplement clarify this and present an enlarged analysis, particularly on item (2).

Our field experience with the ongoing program and our review of the supplement leads us to believe that wetland impacts will be severe because ACP is a voluntary program and is difficult to coordinate concurrently with salinity control measures. BR off-farm programs are well behind USDA efforts in these basins. Planning and environmental compliance documents are at least a year away from completion. FWS and BR are coordinating impact assessment and mitigation activities for the off-farm program, but this does not include any mitigation needs for the USDA on-farm program.

In summary, we recommend that the final supplement discuss and analyze the concept of concurrent planning and implementation of salinity control actions and mitigation. To this end, we suggest that one possible solution is to condition ACP so that cost-share funds are proportionally awarded for salinity control and mitigation measures.

Sincerely,


Bruce Blanchard, Director
Environmental Project Review

Enclosure

SPECIFIC COMMENTS on Water Quality Improvement Program

Page ii. Although BR programs for mitigation of wetland losses are mentioned, it should be made clear that these programs would not mitigate on-farm losses.

Page iii, paragraph 1. We question whether the wetland impacts of the Grand Valley Unit are being offset by voluntary conservation practices. We are not aware of coordination between USDA and our FWS in development of individual conservation plans for the Grand Valley Unit. Documentation of this coordination effort should be provided as well as the specific quantification of wetland losses that are being offset.

Page iii, paragraph 2. Mitigation plans were presented (a worst-case analysis of full mitigation) for the Lower Gunnison Basin, but no mitigation plans have been presented for the Uintah Basin Unit. These plans should also be developed for the Uintah Basin Unit. Since on-farm salinity measures have been implemented under ACP, the mitigation plan could include those items implemented as mitigation in the Uintah Basin for the last two years.

Lower Gunnison Basin Unit (LGBU)

Page I-1, paragraph 1. The figures presented here relating to wetland impact are inconsistent with the Lower Gunnison Wetland Inventory and Evaluation Report published by the Soil Conservation Service in 1979. According to this Report, there are only 8,760 acres of irrigation induced wetlands, not 14,800. The total wetland acreage in the LGBU was estimated to be 21,932, not 39,600 (14,800 + 24,800). Throughout Chapter 4, Part B, wetland acreage figures presented for the project study area exceed 21,932 and vary from 30,000 to almost 38,000. Corrections should be made.

Page IV-3. Plan One would impact 370 acres of wetland according to the Report. Discussion should indicate how this was determined, how the wetlands will be impacted, and if the wetlands are being converted to other uses. This comment applies also to discussions of wetland impacts for other plans.

Page IV, paragraph 3. A statement should be made on how wetlands will be upgraded.

Page IV, paragraph 3. It should be clarified that the off-farm laterals are the responsibility of the Bureau of Reclamation.

Page IV-15. In the Lower Gunnison Basin Unit, more information would be helpful for plan comparison. In Plan 7, different watersheds would receive different implementation. It should be explained how the watersheds were selected for maximum or minimum implementation and point out the differences between the levels of implementation.

Page IV-19. Under the discussion of Additional Alternatives, the statement that, "Categorical retirement of all irrigated land in the valley, first suggested by the Bureau of Reclamation at a public meeting, was eliminated from further consideration because of opposition by the local people," is incorrect. The largest acreage ever considered for retirement was 12,000 acres in contrast to the over 90,000 acres of irrigated land in the Uncompahgre Valley.

Pages IV-19 - 23. Under the recommended plan for Lower Gunnison, the Report states that full mitigation for the impacted wetland would cost \$44 million dollars. The Report is not clear, however, on what habitat mitigation plan, if any, is actually proposed. This point should be clarified.

Page IV-20. One reason for making Plan 8 the recommended plan is cost-effective salinity control. Information presented in Table IV-1, however, indicates that this is not the most cost-efficient plan. Implementation cost is also given as a reason for selecting Plan 8, yet it is the most expensive plan. Additional information should be provided to clarify this issue.

Page IV-22. Figure IV-3 should show the following technical work groups (work support teams): water resources, land resources, engineering, and environmental-social-economics. A public participation group was also involved.

Page IV-24. A "voluntary" wildlife program is described as the most likely scenario for wildlife mitigation. Cost sharing should be conditioned upon farmers concurrently installing or establishing wetland and wildlife practices.

Page IV-30. The correct name for the Cimarron Project is the Bostwick Park Project.

Page IV-32. "The salt from on-farm sources can be reduced by as much as 335,000 tons (76 percent) depending on which alternative plan is implemented." This conflicts with the figures given (370,000 tons, 84 percent) for on-farm salt loads reduction with Plan 8 (page IV-19).

Page IV-38. The procedures for evaluation and excavation of archeological sites discovered during construction are incorrect as outlined. In the event of an emergency discovery, construction should be stopped and the Secretary of the Interior should be notified through the Departmental Consulting Archeologist, Interagency Archeological Services (IAS), Washington, DC 20243 (202) 343-7105. IAS will then initiate investigation within 48 hours to determine any necessary data recovery. This procedure is pursuant to the Advisory Council on Historic Preservation's Regulations (36 CFR 800) and Soil Conservation Service Regulations (7 CFR 656).

In addition, cultural resource surveys conducted by BR for the Lower Gunnison area and for the Grand Mesa area have been completed and could be used to upgrade the discussion on cultural resources. These reports are available in BR's Grand Junction and Salt Lake City offices.

Page IV-41, Table IV-6. The wetland acreage figures presented in this Table differ from those shown in the reference (Rector, et. al). The acreage should be corrected or the differences explained.

Page IV-41, Table IV-7. According to Rector, et. al (1979), there are approximately 8,198 acres of wetlands influenced by irrigation water management, not 14,800.

Page IV-41, last paragraph. The new wetland classification published by FWS in 1979 (Cowardin, et. al, 1969) should be used in place of Circular 39.

Page IV-42, last paragraph. This section does not satisfy Section 7 consultation of the Endangered Species Act. The SCS should prepare a biological assessment addressing possible impacts of the project to the listed endangered species and submit this to the FWS.

Page IV-43. The section on consequences should address the impact on groundwater quality, considering the magnitude of both the change in groundwater volume and the change in salinity increments.

Page IV-45. Under the description of the public participation process, it should be noted that the project area studied by BR consists of the Uncompahgre Valley, a smaller area than that studied by the SCS.

Page IV-46. The reasons for selecting Plan 8 are not clear. The only criterion used in selecting Plan 8 that does not appear to apply to Plan 7 is the desire of local landowners, and they list Plan 7 as the second most desirable. Plan 7 is \$50 million cheaper (\$304,900,000 vs \$357,700,000 when off-farm lateral improvements and mitigation costs are added) and removes only 3 percent less of the salt load (81 percent reduction vs 84 percent reduction) delivered to the Colorado River from on-farm loading. Further, Plan 8 would result in lost habitat values (Table A1-4, page IV-59), making it environmentally less preferable.

Uintah Basin Unit (UB)

Inside cover letter. The term "acre value" is used here and throughout the draft supplement. However, nowhere in the text or glossary is the derivation of an acre value identified. The only explanation given is that an acre value is a comparative

expression between existing habitat and optimum habitat.

Page ii, paragraph 2. The discussion of alternative levels of mitigation is extremely misleading. Under ~~current~~ project plans, there are no alternative levels of mitigation. The small wildlife projects planned by a few individual farmers do not really address the broad picture of mitigating for wetland habitat losses, and are totally dependent upon the farmer having funds available at the end of their long-term agreements with SCS. Development and discussion of adequate mitigation plans are avoided.

Page II-1, paragraph 2. We do not agree with the statement that "no direct changes in land use will be made, and no new land will be brought into production." The loss of riparian habitat along existing canals, laterals, and ditch banks are direct land changes which will affect all wildlife species that use those areas. Wetland habitats will be converted to upland habitats and should be identified as such. The possibility of farmers using conserved irrigation water to bring marginal lands into production needs to be identified and discussed.

Page II-2, paragraph 1. While wildlife mitigation features are being incorporated into some of the long-term agreements with landowners, this program is totally voluntary. Also, there is no guarantee that the majority of landowners will take advantage of the program or that the wildlife features will ever be put into effect. The cooperation of the landowners is essential for any wildlife mitigation features and needs to be addressed.

Page III-2, paragraph 2. The text states, "...water management measures...could cause significant adverse local or cumulative impacts on the environment." The statement should state whether and explain how these impacts are going to be mitigated.

Page V-1, first paragraph. This paragraph should be expanded to include the fact that on-farm measures to control salinity are currently underway with over four million dollars either spent or committed at the present time. Also, the involvement of the SCS in the existing program should be addressed.

Page V-1, paragraph 2. The alternative listed here as "no action" is later classified correctly as "continuation of on-going programs" which is not a no action plan. Construction of water management measures is continuing for the second year. The supplement needs an adequate no action alternative with which to compare the action alternatives.

Page V-1, paragraph 2. The alternatives (moderate level of development, potential level of development, and preferred alternative) do not match with the alternatives presented on pages V-4 through V-8.

Page V-3, paragraph 5, last sentence. It is not clear how reports on "impacts" will be made when data become available.

Page V-3, paragraph 6. We disagree with the statement that water storage facilities are outside the scope of this evaluation. We are aware that our BR is providing several water storage facilities in the Uintah Basin as part of the different units of the Central Utah Project. This should effect more timely water delivery and improve overall on-farm salinity control efforts.

Page V-5, paragraph 5. It is unclear how the additional 18,280 acres of upland habitat are going to be created. This needs to be explained here and for the "maximum potential" alternative.

Page V-7. Complete retirement of all irrigated lands was considered as an alternative in both basins, but does not appear reasonable. However, partial retirement is an alternative that may deserve greater consideration. In the Lower Gunnison Basin, it is not discussed at all and in the Uintah Basin, it is discussed only briefly. Partial land retirement combined with a program of increased efficiency could be cost effective and agreeable to the farmers since, even if they lose the water rights to the retired land, the increased efficiency should give them water for other irrigated lands or other uses.

Page V-8, paragraph 3. Since the preferred alternative was chosen to best fit each evaluation unit, it should be discussed on a unit-by-unit breakdown. Also, there is possible overlap in some of these units with work being planned and implemented by the SCS under the small watersheds program. This is particularly true for the Dry Gulch Unit and the Martin Lateral and Dry Gulch Watershed Projects.

Pages V-8, V-10 and V-29. Much of the area shown for sprinkle irrigation would need pumping because of the lack of gravity head. The question arises as to whether the local farmers would support the costs associated with such systems. This aspect should be clarified.

Page V-11, Table V-2. The Table needs to include columns for both existing conditions and a "no action" alternative.

Pages V-12 and V-13, Mitigation. There is no explanation of the mitigation plan for the preferred alternative or other alternatives presented earlier in the report. The loss of wetland habitat (13,000 acres), assuming full implementation of the recommended plan, is a significant acreage loss of a valuable and relatively scarce habitat type within the study area. Section 2.(a)(2) of Executive Order 11990 states that "the proposed action includes all practicable measures to minimize harm to wetlands..." A definite proposed mitigation plan should be developed for habitat losses and should be included in the final supplement.

Page V-12, paragraph 2. The statement is made that, "...wetland losses...are being minimized by including wildlife conservation practices in the conservation plan for individual farms..." While the concept behind this type of mitigation may be sound, the fact is that a very limited amount of funds are being committed to wildlife practices. There is no guarantee that those landowners who are participating in the preogram will have available funds remaining at the end of their long-term agreements to implement those plans. It should also be stated that the cost-share rate for long-term agreements is 75 percent, not 90 percent.

Page V-13, first paragraph, first sentence. The sentence implies that a mitigation plan is available. The final supplement should outline the plan and evaluate its impacts.

Page V-14, paragraph 2. The text states that, "...SCS wetland policy was written to allow for certain policy exceptions, if necessary, to meet identified irrigation water management (water quality and water conservation) objectives." However, this draft includes no identification or discussion on what direction and/or policy exceptions the State Conservationist, SCS, Utah, has initiated to deal with the conflicts between improved irrigation management and the loss of wetland habitat.

Page V-23, paragraph 2. It is implied that agricultural practices in the Uintah Basin have created a monotypic habitat. This is not so. The canals, laterals, ditches, and fence rows support a great diversity of vegetation which, in turn, supports diverse communities of upland game, waterfowl, small mammals, and bird species. This paragraph should be expanded to describe accurately the habitat in and adjacent to the farmlands. Future agricultural practices with the project will create a more monotypic habitat unless care is taken to maintain the diverse vegetation along these important habitat areas.

Page V-25, Classification Table. The classification table shown for lakes and streams does not identify any Class I streams. However, according to the 1978 Stream Evaluation Map for the State of Utah, the Duchesne River downstream from the mouth of the Uinta River (included in Lower Duchesne River Area Unit), is listed as a Class I highest-valued fishery resource stream.

Page V-25, paragraph 1. This section is entitled "Environmental Consequences" but it is not stated which alternative(s) it should apply to. How can irrigation losses be inversely proportional to irrigation efficiency? We suspect the "irrigation losses" should instead read wetland losses."

Page V-26. This section should address the effects of the project on groundwater quality.

Page V-26, first paragraph, last sentence. The words "irrigation losses" should be changed to "wetland losses."

Page V-27. The discussion of water quality should address changes in the Duchesne and Green River systems as well as the Colorado River.

Page V-28. With the discussion of erosion and sedimentation in the Environmental Consequences Section, the current status of erosion and sedimentation in the Uintah Basin should be presented in the Affected Environment Section. Also, see comments for Page II-1, paragraph 2.

Page V-29, paragraph 4. It is most likely that present ditch-bank vegetation will be permanently eliminated. The present ditchbank habitat is comprised of a diversity of vegetative species, many of which are dependent upon water from the associated ditches. The elimination of these ditches will result in the loss of vegetation that cannot be replaced through the seeding of upland plant species.

Page V-29, fourth paragraph, last sentence. Explanation of the term "managed appearance" would be helpful.

Page V-30, paragraph 1. We agree that implementation of the on-farm water management measures will require less water to be diverted for irrigation. However, the landowners who own the water rights may continue to divert the same amount of water, in order to retain their rights. This way may in turn be used to bring marginal lands, which are presently non-irrigated, into production or irrigate some lands for which there is not a full source of water at present, thus offsetting the benefits of the on-farm program. The draft supplement fails to identify this problem, and how the SCS intends to deal with it.

Page V-30, first full paragraph. Based upon the information provided on Page II-1, second paragraph, the total wetland loss (which includes riparian, wetland, and grass-sedge habitat types) would be 13,000 acres. If there is a total of 48,760 acres of wetland habitat in the study area, there would be a 27 percent total loss in wetland habitat as a result of the project. The paragraph needs to be expanded and clarified to indicate the true adverse impacts of the project. (Table V-9 in Appendix C-9 also needs to be expanded to show the losses.)

Page V-30, paragraphs 2 and 3. As mentioned previously, to say that, "wildlife habitat maintenance and improvement features will be accomplished (voluntarily) through long-term agreements with individual farmers," is misleading. This program cannot begin to adequately mitigate for the loss of over 19,000 acres of wetland habitat. In sentence 4, paragraph 2, the term "wildlife habitat" should be corrected to read "wetland habitat."

Page V-30, paragraph 4. This discussion does not mention the importance of the edge habitat along ditches and fence rows for nesting, travel, and living areas for many species of wildlife. Much of the habitat along these ditchbanks includes riparian, as well as upland vegetation.

Pages V-30, V-31, Upland Wildlife Habitat. An increased food source is a direct positive benefit to upland wildlife; however, adverse impacts, such as loss of important nesting and escape cover, should be evaluated to determine a net impact to upland game populations. Without a definite mitigation plan, substantial losses to populations and the associated recreation hunting potential could be permanently lost as a result.

Page V-31, paragraph 1. Improved crop rotation with small grains will provide a good food course for upland game birds. However, the existing edge habitat along ditches and fence rows provides necessary escape cover for birds using the agricultural fields, and the elimination of the edge habitat will lower the value of the agricultural fields for upland game birds.

Page V-31, paragraph 3. The "...intensive wildlife habitat preservation and enhancement program..." needs to be identified and discussed. The meager attempt at mitigation through voluntary long-term agreements can hardly be considered intensive.

Page V-36. We are disappointed and disturbed that the notice of the scoping meeting appeared in the Federal Register on August 26, 1980, and the scoping meeting was held on August 19, 1980 (page V-35).

Page V-36. The multi-objective planning team referred to has not been active since initiation of the on-farm improvement programs by the Agricultural Stabilization and Conservation Service. Also, there is a new interagency coordination procedure now whereby the Bureau Chiefs of Planning and Water Resources Divisions in Provo, Utah, consult directly with the SCS District Conservationists in Roosevelt, Utah. This aspect should be clarified.

Page V-40, Appendix A. It should be explained why the Consumptive Use (in column 4) varies for each of the alternatives with apparent fixed acreage and cropping pattern.

Page V-45, Table V-8, Environmental Quality Account. To aid the reviewer in assessing impacts of the four alternatives, this Table should include a quantification of wildlife resources and habitat.

Page V-47, Table V-9, Irreversible or Irretrievable Commitments. This section should include as item 3 the loss of wetlands that cannot be mitigated with the voluntary program.

STATE OF COLORADO

COLORADO WATER CONSERVATION BOARD

Department of Natural Resources

823 State Centennial Building

1313 Sherman Street

Denver, Colorado 80203

Phone: (303) 866-3441



Richard D. Lamm

Governor

J. William McDonald

Director

David Walker

Deputy Director

July 28, 1981

Mr. Charles F. Lemon, Director
Soil Conservation Service
West Technical Service Center
511 North West Broadway
Portland, Oregon 97209

RE: Comments on the report entitled "Draft Supplement to the Colorado River Water Quality Improvement Program Final Environmental Statement for Lower Gunnison Basin Unit, Montrose and Delta Counties, Colorado and Uintah Basin Unit, Duchesne, Wasatch and Uintah Counties, Utah" dated May 1981.

Dear Mr. Lemon:

We have reviewed the above subject report and offer the following comments.

Page III-3 and 4 - The material on these two pages is outdated and inaccurate. For example, a plan of implementation is not required as a part of a water quality standard under the Clean Water Act of 1977. Furthermore, the cited EPA regulation is no longer in effect. Attached is a suggested re-writing of these two pages.

Page IV-21 - The \$19,700,000 mitigation plan is not substantiated and appears to be a disproportionately high percentage of the total cost for Stage One. We question the need for such mitigation.

Page IV-30 - The length of the growing season for Delta and Montrose is not consistent with the change in elevation.

Page IV-59 - Line C-3 of Table A1-4 is either mislabeled or has incorrect data displayed.

VI-88

COLORADO WATER CONSERVATION BOARD, Frederick V. Kroeger, Chairman
Robert A. Jackson, Vice Chairman • John R. Fetcher, Steamboat Springs
C.M. Furneaux, Walden • Floyd L. Getz, Monte Vista • Patrick A. Gormley, Grand Junction
Richard W. Johnston, Montrose • David W. Robbins, Denver • Herbert H. Vandemoer, Sterling

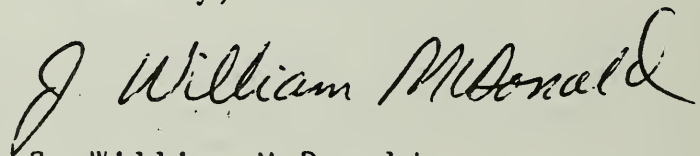
Mr. Charles F. Lemon, Director
July 28, 1981
Page two

The report does not address the winter watering of livestock, an issue that is very crucial to plan implementation in the Lower Gunnison Unit. The Lower Gunnison plan involves the lining of canals and laterals with concrete. This lining may be damaged by the water if it is allowed to flow in these canals during freezing weather. A discussion of the possible alternatives would be helpful.

Why does the Lower Gunnison Unit require more land for mitigation of wetlands than the Uintah Unit? For example, the preferred plan for Lower Gunnison impacts 13,200 acres of wetlands and requires upgrading of 18,300 acres of wetlands elsewhere, plus developing new wetland habitat on 3,700 acres. In the Uintah's preferred plan, 22,470 acres of wetland would be changed to 8,663 acres of upland habitat and would create an additional 24,600 acres of upland habitat. These acreages do not seem to be consistent.

If you have any questions concerning these comments, please feel free to call me or Dan Law of my staff.

Sincerely,



J. William McDonald
Director

JWM/ql

cc: Mr. Jack Barnett
Mr. Mike Clinton
Ms. Marcia Hughes
Mr. Monte Pascoe
Mr. Bill Plummer
Mr. David Robbins
Mr. Daniel Lawrence
Mr. J. F. Rinckel
Mr. Roland C. Fischer
Mr. Al Campbell
Mr. Dick Johnston
Mr. Jack Grieb
Mr. Sheldon Boone

Suggested Re-Write of Pages-III 3 and 4

Section 303 of the Clean Water Act requires adoption of water quality standards applicable to interstate waters. The Act's objective is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Section 101), and the Administrator of EPA is required, in cooperation with other Federal, State and local agencies, "to develop comprehensive programs for preventing, reducing, or eliminating the pollution of navigable waters and ground waters (Section 102a)."

The seven states of the Colorado River Basin acting through the Colorado River Basin Salinity Control Forum developed and agreed upon basinwide water quality standards for salinity, including numeric criteria and a plan of implementation for salinity control in 1975 (1975 Forum report). Each of the Basin-adopted water quality standards were subsequently approved by EPA. The 1975 report described the rationale for the selection of the criteria stations.

In response to Section 303(c) of the Clean Water Act, the Forum in 1978 reviewed the standards. The Forum determined that this 1975 criteria were appropriate. The Forum also reviewed and modified the plan of implementation in 1978. Appropriate documents were adopted by the states.

Again, in 1981, the Forum in response to Section 303(c) reviewed the criteria and determined that the 1975 criteria are still appropriate. The numeric criteria are:

Below Hoover Dam	723 mg/L
Below Parker Dam	747 mg/L
Imperial Dam	879 mg/L

As in 1978, the plan of implementation was reviewed and modified to reflect changes that have occurred since 1978. The principal components of the plan are:

1. Prompt construction by the Department of the Interior of two salinity control units authorized by Section 202, Title II, of Public Law 93-320, namely the Paradox Valley and Grand Valley Units.
2. Expeditious authorization and construction by the Department of the Interior of the Meeker Dome Unit and 10 of the units listed in Section 203(a)(1), Title II of Public Law 93-320, or their equivalents after receipt of favorable planning reports.
3. Expeditious implementation by the Department of Agriculture of onfarm and related improvement measures for salinity control.

4. Implementation of salinity control measures by the Bureau of Land Management to reduce salt contribution from public domain lands.
5. The placing of effluent limitations, principally under the National Pollutant Discharge Elimination System (NPDES) permit program, provided for in Section 402 of the Clean Water Act of 1977 on industrial and municipal discharges based on the Forum's 1977 policy on salinity control through the NPDES permits.
6. Implementation of the 1980 Forum policy for the use of brackish and/or saline waters for industrial purposes.
7. Inclusion of the 208 Water Quality Management Plans. Individually, the Basin states have developed water quality management plans to conform to the requirements of Section 208 of the Clean Water Act. The water quality management planning process is continuing. As the plans are refined or new elements added and after such changes have been adopted by the states and approved by EPA, those portions of the plans dealing with salinity control will become part of the implementation plan.

SHAVANO SOIL CONSERVATION DISTRICT

c/o Lester Jones
60489 Carnation Road
Olathe, Colorado 81425

August 3, 1981

Charles F. Lemon
Director
Soil Conservation Service
West Technical Service Center
511 N.W. Broadway
Portland, Oregon 97209

Dear Sir:

The Shavano Soil Conservation District Board of Supervisors discussed the draft report of the Lower Gunnison Basin Unit Salinity Control Program at regular session June 9, 1981. The District has supported the program since its inception and is pleased to learn that it is progressing toward eventual implementation. It is gratifying to note that Plan #8 is recommended in as much as local citizens voted overwhelming for that alternative.

It is our understanding that semi-automated irrigation systems are mandatory. Apparently this requirement has been established by ASCS, as Denver SCS representatives have indicated it is not a dictate of the Soil Conservation Service. We of the Shavano Board agree with the Montrose County ASC Committee that automation must not be mandatory. We believe there are numerous factors that will adversely effect semi-automation including variable irrigation water supplies, varying soil conditions throughout the season, irregular shaped fields and more. There are few farmers who've embraced the concept of semi-automation, and quite frankly, we feel that the theoretical salt reductions of level 3 as displayed in Table IV - 1, page IV - 5, are questionable.

Limiting payments to \$3500 per year per farmer is not too palatable. The District believes that the producer should receive cost share payments when each job is completed. The benefits are obvious - interest payments for anyone proceeding ahead of schedule, to combat inflation, would be smaller. The application of conservation measures could be accelerated and salt reduction would proceed at a more rapid pace. Surely costs to the federal government would be less if works were installed at today's prices instead of five years hence. We believe there should be no annual earning limit.

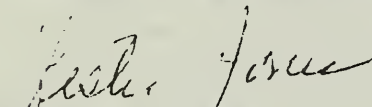
There should be no cost sharing unless an overall, multi-year plan is developed. Contracting in a manner similar to that utilized for Long Term Agreements should be developed for each participant so that he is assured that funds are available for future years' work.

During the years since the first field studies were initiated, the Shavano Soil Conservation District has supported the program. Supervisors have devoted time and incurred expenses as they participated in meetings, toured the Grand Valley Project, etc. Needless to say, we're disappointed to learn that all activities for the first



10 years will be restricted to the Delta County portion of the Lower Gunnison Basin Unit. Areas of total salt contribution (tons/acre - not parts per million from a low volume stream) should have been considered in selecting high priority areas and watersheds for early treatment. We believe that lands east of the Uncompahgre-River in Montrose County should be included with those in Delta County as high priorities.

The Bureau of Reclamation has not recognized a responsibility for canal and lateral improvements outside the Uncompahgre Project. This project does not include the North Fork of the Gunnison Valley where SCS activities are scheduled for the first ten years of on-farm salinity work. Only one designated watershed of the four tentatively scheduled for the first ten years' effort is within the Uncompahgre Project. It seems somewhat ludicrous that SCS efforts will be directed toward on-farm efforts in one area while the Bureau expends their improvement funds to reduce deep percolation elsewhere.


Lester Jones
Chairman



COLORADO
HISTORICAL
SOCIETY

The Colorado Heritage Center 1300 Broadway Denver, Colorado 80203

Charles F. Lemon

July 1, 1981

Director

Soil Conservation Service

West Technical Service Center

511 N.W. Broadway

Portland, OR 97209

Dear Mr. Lemon:

This is to acknowledge receipt of the draft supplement to the Colorado River Water Quality Improvement Program Final Environmental Impact Statement.

DATE RECEIVED June 11, 1981

DATE DUE August 4, 1981

The federal agency has outlined certain provisions in this document for cultural resources management to comply with Executive Order 11593 and the National Historic Preservation Act as amended.

Once these conditions have been adhered to, in consultation with this office, in accordance with 36 CFR 800, compliance will be achieved.

Thank you for the opportunity to comment on the proposed project.

If this office can be of further assistance, please do not hesitate to call upon the Compliance Section at 839-3391.

Sincerely,

Arthur C. Townsend

State Historic Preservation Officer



Gordon E. Harmston
Executive Director
Dept. of Natural Resources

Scott M. Matheson
Governor

DIVISION OF WATER RESOURCES

Suite 300
231 East 400 South
SALT LAKE CITY, UTAH 84111
Tel: (801) 533-5401

Daniel F. Lawrence
Director

BOARD OF WATER RESOURCES

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(Upper Colorado)

Roy P. Urie

Cedar City

(Lower Colorado)

Mr. Charles F. Lemon, Director
Soil Conservation Service
West Technical Service Center
511 N. W. Broadway
Portland, OR 97209

Dear Mr. Lemon:

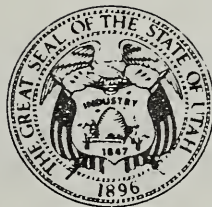
We have reviewed the May 1981 draft Supplement to the Colorado River Water Quality Improvement Program Final Environment Impact Statement for the Lower Gunnison Basin and Uintah Basin Units. Relevant factors appear to be adequately identified and considered.

We have supported and will continue to support efforts to control Salinity in the Colorado River. The USDA on-farm Salinity Control Program is already underway in the Uintah Basin Unit (albeit in a small way) and is well received. We think that this program will be significant in controlling Salinity in the Colorado River Basin and hope that funding will be made available to accelerate it.

Sincerely,

Daniel F. Lawrence
Director

Scott M. Matheson
Governor



Kent Briggs
State Planning Coordinator

STATE OF UTAH
Office of the
STATE PLANNING COORDINATOR
124 State Capitol
Salt Lake City, Utah 84114
(801) 533-5245

August 5, 1981

Charles F. Lemon, Director
Soil Conservation Service
West Technical Service Center
511 N. W. Broadway
Portland, Oregon 97209

Dear Mr. Lemon:

SUBJECT: Draft Supplement to Colorado River Water Quality Improvement
Program, FEIS
SAI Number UT810610-020

The Resource Development Coordinating Committee (RDCC) of the
Utah State Clearinghouse has reviewed this draft supplement. Comments
are attached for your consideration from the Division of Wildlife
Resources.

Thank you for the opportunity to review this draft supplement.

Sincerely,

A handwritten signature in dark ink, reading "Marthe F. Dyner".

Marthe F. Dyner
State Planning Coordinator

MFD:sb
Attachment

cc: Earl Sparks



DIVISION OF WILDLIFE RESOURCES

LOCAL GOVERNMENT EMPLOYER

DOUGLAS F. DAY
Director

1596 West North Temple/Salt Lake City, Utah 84116/801-533-9333

July 23, 1981

Ms. Juline Christofferson
State Planning Coordinators Office
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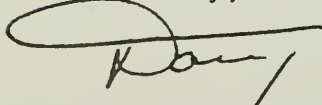
Dear Juline:

We have reviewed the Draft Supplement to the Colorado River Water Quality Improvement Program Final Environmental Statement (Ref. UT810610-020). Our comments pertain only to the Uintah Basin Unit portion of the Draft Supplement and point to some serious inadequacies in the document as well as in the ongoing program.

Our greatest concern relates to the totally inadequate mitigation of impacted wildlife habitat. Paragraph 1 on page i of the document states that the supplement was written because "additional information now available from SCS environmental evaluation of USDA federally-assisted nonproject action underway, indicates that implementation . . . could cause significant adverse local or cumulative impacts on the environment." The Supplemental Statement fails to provide any acceptable mechanism for mitigating these significant impacts. We do not accept the statement on page V-30, paragraph 3, sentence 3, that the voluntary mitigation program has or will offset wildlife habitat losses. Mitigation would require quantitatively identifying project losses and likewise compensating for these losses quantitatively. There is no such plan and the voluntary approach under nonproject funding has not begun to compensate for impacts. The fact that the Supplemental Statement has been deemed necessary would indicate that the program has been planned as a project and yet it continues to be implemented as nonproject under ASCS cost share funding. We do not support this approach and believe that the past two years of construction vividly demonstrate the significant wildlife habitat losses that will go unmitigated if the program continues as at present. Special project funding including that for adequate impact mitigation must be provided or the project should be terminated.

Enclosed are our specific comments to the Draft Supplemental Statement.

Sincerely,



Douglas F. Day
Director

Enclosure

Draft Supplement to the
Colorado River Water Quality
Improvement Program Final
Environmental Statement

Specific comments:

inside cover letter: There is no explanation on this page or anywhere throughout the document concerning the derivation of habitat units or acre values. These designations must be documented as to the supporting data base and there should be a thorough explanation of what is represented by their use.

page ii, paragraph 2, sentence 4. Under current project guidelines there is no mitigation. The very few wildlife projects planned by individual farmers are not addressing specific losses nor are they intended to compensate for losses at any identifiable level. There is no relationship to any planned mitigation and the implementation of these scattered and relatively insignificant wildlife practices.

page iii, paragraph 2, sentence 1. We would agree that if the project continues to be implemented as it has to date, there will be no significant impact mitigation let alone full mitigation for wildlife habitat losses.

page II - 1, paragraph 2. Those acres identified separately as riparian habitat, wetland habitat, greasewood and saltcedar, and grass-sedge habitat are, in fact, all wetland habitat types and should be identified as such.

page II - 2, paragraph 1, sentence 2. Again, the identification of the wildlife practices as project mitigation is not correct. There are no quantitative project losses with related quantitative mitigation compensation. If this were done, it would indicate that there is no significant mitigation occurring in the Uintah Basin Unit.

page III - 2, paragraph 2. We agree that there will be significant adverse impacts to wildlife. The supplemental impact statement fails to indicate how the significant impacts will be adequately mitigated. It needs to be noted here also that the water management measures in the Uintah Basin Unit are being constructed and are already causing significant adverse impacts.

page V - 1, paragraph 2. There is no realistic no action alternative as construction under accelerated federal funding is entering it's second year. Four million dollars has been spent or committed in the Uintah Basin Unit to date.

Pages V - 12, V - 13, Mitigation. This entire section of the supplemental statement very clearly demonstrates the inadequacy of the "mitigation" proposal. The current program which is the preferred alternative relies exclusively on voluntary commitments of landowners for what is called mitigation. While SCS may be making every effort to include wildlife practices

in the conservation plans, a look at the success of this effort to date leaves no doubt that it is not working. As of June 2, 1981, four million dollars has either been spent or committed to the on-farm ASCS funded salinity reduction program in the Uintah Basin. Of this total, only \$16,341.00 has been committed to wildlife practices on over 116 conservation plans under long term agreements. Out of one million dollars committed for 1981 in Duchesne County, only \$439.00 has been committed to wildlife practices. The suggestion that this be termed a wildlife mitigation plan that will offset losses (page V - 30, paragraph 3, sentence 3) is totally invalid.

The last sentence in paragraph 1 is very misleading. There is no requirement that landowners include any wildlife practices in their conservation plan of operations and thus the indicated agreement would be valid only if a practice is agreed to. As we have shown, the amount of money spent or committed on wildlife practices is very small.

The second paragraph on page V - 12 states that "wildlife practices have been available at a 90 percent cost share rate." This is again misleading, as only on annual agreements has this 90 percent cost share rate been available. On Long Term Agreements, the cost share for wildlife practices is 75 percent which is the same as for the irrigation improvement features of the program. To our knowledge, all money committed to wildlife practices has been under Long Term Agreements at this 75 percent cost share rate. (See also page iii, paragraph 1.)

Paragraph 3 on page V - 12 suggests that the USDA wetland mitigation options could be included as part of the Department of Interior's Bureau of Reclamation off-farm mitigation plan. It seems a very doubtful proposal to ask one agency to fund the mitigation for another agency's project. We are aware of no commitments by the Bureau of Reclamation to pick up the tab for negative impacts generated by the on-farm program nor do we think this would occur.

The third mitigation proposal on page V - 13 would be the only reasonable approach to project implementation. The elimination of the ASCS farm by farm non-project cost share program as a tool for salinity program implementation is necessary if project losses are to be mitigated. This would necessitate congressional approval of the salinity program as a special project with subsequent appropriation of funds including those necessary for adequate mitigation of losses. The voluntary approach is not and will not work. Valuable wetland losses will go unmitigated and wildlife populations dependant on this critical habitat will be seriously impacted.

page V - 23, paragraph 2. Uintah Basin farming practices have not resulted in a monotypic habitat with very little vegetative diversity. To the contrary, the Uintah Basin offers some of the best on-farm vegetative diversity in Utah and has some of the State's best upland game and waterfowl populations. The fence rows and ditches add significantly to this diversity and project impacts will be substantial as these are eliminated. The future with the project will be much as described with larger blocks of much more monotypic habitat minus more than 1500 miles of on-farm earthen ditches.

- page V - 24, paragraph 3. The bald eagle is a winter visitor to Utah and is not here during the nesting season.
- page V - 26, paragraph 1. The words "irrigation losses" should be "wetland losses". We fail to see the relationship of wetland losses as being inversely proportional to improved irrigation efficiency. The supposition needs some supporting data.
- page V - 26, paragraph 4. This sentence identifies the preferred plan as the selected plan. There really are no alternatives as the plan has not only been selected, but implementation has been ongoing for some time as previously noted.
- page V - 29, paragraph 4. It is most probable that the elimination of ditches will result in the permanent elimination of the ditch bank vegetation. Many field borders will be eliminated as larger sprinkling systems replace existing ditches and fence lines.
- page V - 30, paragraph 1. Although plan implementation will require less water to be diverted, we believe that the value of water will result in the farmer continuing to divert the same amount to maintain his same water right. This obviously defeats program objectives, but SCS has failed to provide an answer to this question asked at many public meetings. If the farmers did give up any diversion rights, then this water would again be made available for reappropriation by the Utah Division of Water rights.
- page V - 30, paragraph 2, sentence 4. The words "wildlife habitat" should be changed to "wetland habitat". Over 40 percent of the wetland habitat in the project area will be lost. This will greatly impact upland game and waterfowl populations as well as many other wildlife species.
- page V - 30, paragraph 3. As the project is now being implemented, the existing wildlife habitat monitoring program should be fully explained. The statement in sentence 3 is incorrect. The voluntary program will not begin to offset the loss of 19,860 acres of wetland habitat.
- page V - 30, 31, upland wildlife habitat. The real benefit of the project impacted upland habitat is overlooked in this explanation. Travel corridors and nesting habitat in these extensive narrow strips that are uncut during harvesting are of immense value to wildlife populations.
- page V - 31, paragraph 3, sentence 2. To characterize the present wildlife habitat preservation and enhancement program as intensive is in error. It is a minimal effort at best.
- page V - 35, 36. Public Meetings. There are serious questions that should be answered concerning the August 19, 1980 public meeting in Roosevelt. Our agency was unaware of the meeting until one day before it took place. We were unable to attend. The federal register notification of the meeting occurred one week after the meeting as noted on page V - 36. In addition, the public notice in the local newspaper announcing the meeting appeared two days after the scoping meeting was held. The reasons for this should be explained.

page V - 36, paragraph 3. To our knowledge, the multi-objective planning technical team for the off-farm salinity program has never actively functioned. There have been some public meetings, but no formal technical team organization or meetings have occurred. We have requested participation with the environmental subteam and have yet to see it organized and functioning.

page V - 46, A.2. Although the elimination of 1,540 miles of earthen ditch involves visual changes, it should more appropriately be placed in Section C. Table V - 9 addresses only the preferred plan and provides no comparisons with other alternatives as is done on Tables V - 3 through V - 8.

page V - 46, 47, C. 2 - 5. All are wetland habitat types and should be identified as such.

page V - 47, E. Loss of nearly 20,000 acres of wetlands should be noted as an Irretrievable commitment with the adoption of the preferred plan.

VII GLOSSARY

ACP Agricultural Conservation Program

Acre value - A comparative expression of habitat value between the specific kind of habitat being evaluated and an acre of optimum habitat; e.g., a specific habitat having only 2/3 of the value of optimum habitat would have a rating of 0.66. In terms of habitat value it would take 1.5 acres of this habitat to equal 1 acre of optimum habitat.

ASCS - Agricultural Stabilization and Conservation Service

CEQ - Council on Environmental Quality

Compact apportioned water - The share of water flowing in the Colorado River legally allocated to each state in the Colorado River drainage.

Conservation practice - Action taken or practices applied on the ground to protect the soil, to conserve water, or to benefit wildlife.

Cost effective - One way of considering, comparing and ranking salinity control actions based on unit cost for potential reduction in salt loading.

Crop budget - An estimate of the unit cost and unit return for producing a crop. A budget consists of a systematic listing and evaluation of the cost and the value of operations performed, physical resources used, and products produced.

Gley characteristics of soils - The presence of unoxidized earth metals caused by lack of oxygen in continuously wet or frequently saturated soils.

Habitat value unit - A value derived from multiplying the habitat suitability for an evaluation species by the size of the area for which the habitat suitability was calculated. The habitat value unit provides a standardized basis for comparing habitat changes over time and space.

Hydrophyte - A plant that grows in water or in saturated soil and that consumes a large quantity of water.

Irrigation source control unit - A salt contributing area identified in P.L. 93-320, the Colorado River Basin Salinity Control Act, where farm irrigation is a significant activity and source of salt loading.

Mitigation - Includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

Multi-objective planning - Combining the natural and social sciences and the environmental design arts to evaluate and consider economic, physical, and environmental effects in the planning and decisionmaking process.

N.E.P.A. - National Environmental Policy Act

Nonproject actions - Nonproject actions consist of technical and/or financial assistance provided to an individual, group, or local unit of government by SCS primarily through a cooperative agreement with a local conservation district, such as land treatment recommended in the Conservation Operations, Great Plains Conservation, Rural Abandoned Mine, and Rural Clean Water Programs. These actions may include consultations, advice, engineering, and other technical assistance that land users usually cannot accomplish by themselves. Nonproject treatment and/or financial assistance may result in the land user installing field terraces, waterways, field leveling, onfarm drainage systems, farm ponds, pasture management, conservation tillage, critical area stabilization, and other conservation practices.

On-going program - The process of implementing irrigation water management and erosion control practices by landowners either with or without federal cost-share assistance.

Phreatophyte - A deep rooted plant that obtains its water from the water table or the soil just above the water table.

Principles and Standards accounts - A tabular display comparing the beneficial and adverse effects of alternative plans evaluated in four categories. These are: National Economic Development, Regional Development, Environmental Quality and Other Social Effects.

SCD - Soil Conservation District

SCS - Soil Conservation Service

USFWS - United States Fish and Wildlife Service

USBR - United States Bureau of Reclamation

Wildlife Conservation Practice - Protecting or developing shallow water areas and vegetation that provides food and cover for use by wildlife.

VIII. LIST OF PREPARERS

A. Lower Gunnison Basin Unit

Name M. Earl Hess
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Name E. W. Mustard
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Name Nyle Jordre
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Name Al Elkin
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B. Uintah Basin Unit

Name James D. Maxwell
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Planning Staff Leader, SCS, Salt Lake City--2 years;
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Name R. Steve Scheldt
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Name Mark M. Petersen
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Name James D. Louthan, P.E.
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Name	Salvador Palalay
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Name	Beverly Miller
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Name	Alan C. Spencer
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Name	Arnold M. Wochnick
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C. Technical Assistance and Review

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Name	John D. Hedlund
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Name	Paul K. Koluvek
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Name	Lowell Dean Marriage
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Assignment	Reviewer
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Name	Clinton Russell
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IX. BIBLIOGRAPHY

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